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Directory of New Brunswick Researchers in Science and Technology

Compiled and edited by

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Sackville, New Brunswick
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INTRODUCTION

The Directory of New Brunswick Researchers in Science and Technology is a compilation of scientists and engineers who are employed primarily in universities and governmental organizations. Many of these researchers have expertise which could aid New Brunswick companies. This publication is intended to serve as a timely record of the names, addresses, and professional interests of New Brunswick researchers. Entrepreneurs, innovators and researchers can use this directory as a primary information resource.

This directory was compiled by the Information Transfer Office at Mount Allison University. The information for this first edition was gathered from questionnaires distributed and only includes those scientists and engineers who responded to the survey.

This is the first edition of the directory. Comments on the usefulness, completeness, accuracy and future improvements would be greatly appreciated.

ACKNOWLEDGEMENTS

This publication was made possible with the support of the New Brunswick Department of Commerce and Technology, the Atlantic Canada Opportunities Agency and Mount Allison University under the Industrial Innovation and Technology Development Subsidiary Agreement. Thanks are extended to all New Brunswick researchers who completed and returned the questionnaires.

Diane N. Buhay
Information Transfer Coordinator
December 1989

HOW TO USE THE DIRECTORY

This directory is divided into three sections. The first is the location of the institutions, the second is a detailed list of researchers and their activities, and the third is comprised of three indexes which allow access by name, discipline and institution.

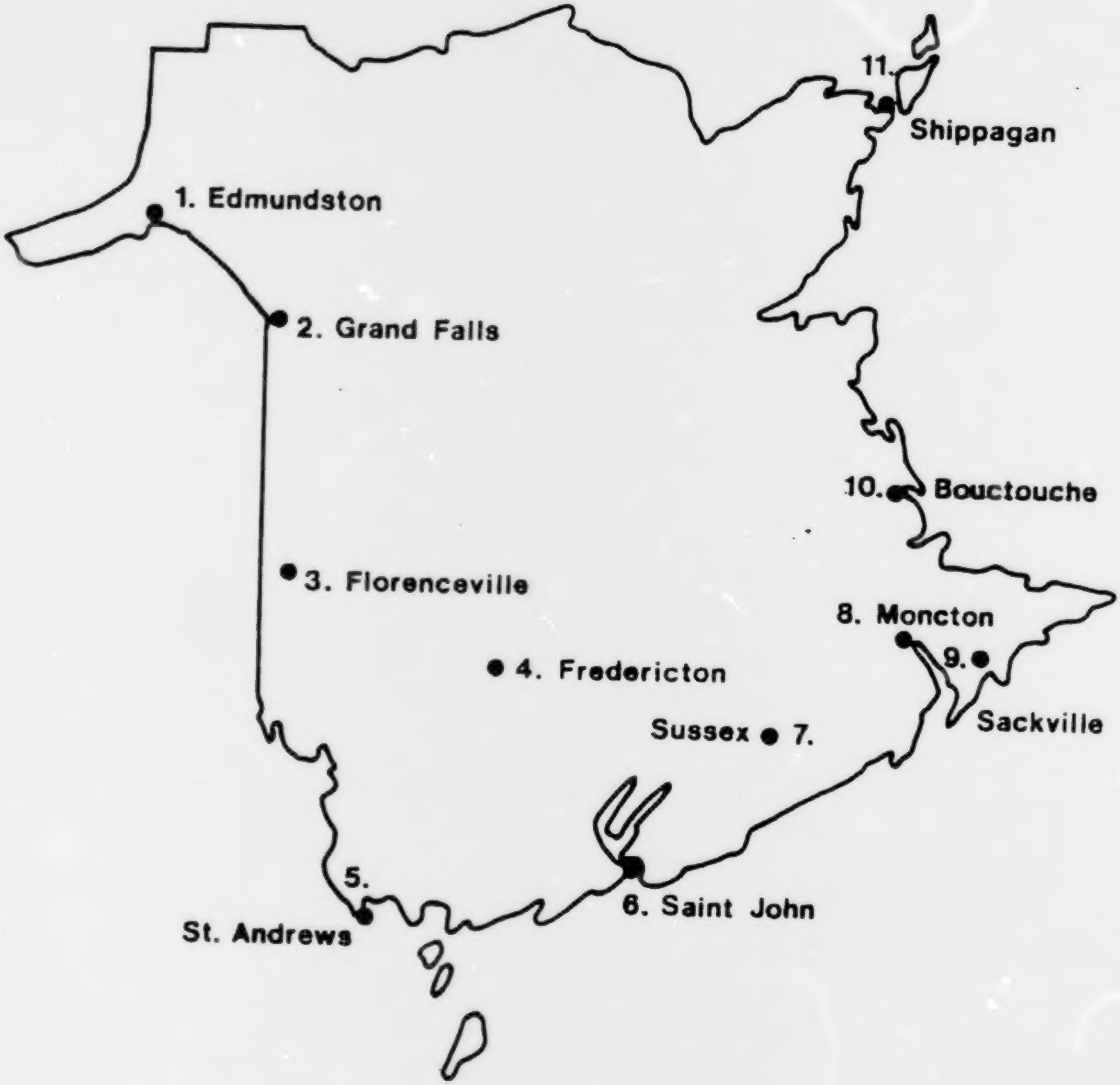
List of Researchers

In the second section researchers are arranged alphabetically and are given a sequential reference number. Each record contains information on their education, discipline, address, and research interests.

Indexes

All three indexes in the third section are cross-referenced to the second section by the reference number. The name and discipline indexes are arranged alphabetically. The institution index is arranged by the parent organization.

LOCATION OF THE INSTITUTIONS


1. Edmundston
2. Grand Falls
3. Florenceville
4. Fredericton
5.
St. Andrews
6. Saint John
Sussex 7.
8. Moncton
9.
Sackville
10. Bouctouche
11.
Shippagan

LEGEND

1.	**Edmundston**	Université de Moncton - Centre universitaire Saint-Louis-Maillet
2.	Grand Falls	**New Brunswick** Department of Agriculture
3.	Florenceville	New Brunswick Department of Agriculture
4.	Fredericton	Agriculture Canada - Research Station Forestry Canada - Maritimes Region New Brunswick Department of Agriculture New Brunswick Department of Natural Resources and Energy Research and Productivity Council University of New Brunswick
5.	St. Andrews	Fisheries and Oceans - Biological Station Huntsman Marine Science Centre
6.	Saint John	New Brunswick Museum University of New Brunswick
7.	Sussex	Sussex Tree Nursery
8.	Moncton	Georges L. Dumont Hospital Environment Canada - Water Quality Branch Fisheries and Oceans - Science Branch Moncton Hospital Université de Moncton
9.	Sackville	Agriculture Canada - Health of Animals Laboratory Environment Canada - Canadian Wildlife Service Mount Allison University
10.	Bouctouche	Agriculture Canada - Senator Hervé J. Michaud Experimental Farm
11.	Shippagan	Aquarium and Marine Centre Université de Moncton - Centre universitaire de Shippagan

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1. **ACRES, JOHN CHARLES.** MD. MEDICINE. Suite 223, 100 Arden St, Moncton, NB E1C 4B7. Tel: (506) 857-5273.

   Research: We participate in trials of new drugs organized by various pharmaceutical firms.

2. **ADAMS, GREG WILLIAM.** MScF (UNB, Forestry). FORESTRY (TREE IMPROVEMENT). Sussex Tree Nursery, RR #4, Sussex, NB E0E 1P0. Tel: (506) 433-4253 Fax: (506) 433-6218.

   Research: Main activities are development and implementation of a genetic tree improvement program for black spruce, white spruce, norway spruce, jack pine and tamarack. This is an operational program designed to supply genetically improved seed for the reforestation program. Activities include orchard establishment, tree breeding and progeny testing. Applied research has focused on shortening breeding cycles of forest trees and includes accelerated growth techniques, flower induction and early testing. Interest is also developing in the area of clonal forestry.

3. **AIKEN, RONALD BURLEIGH.** BSc (Maryland); MSc, PhD (Toronto). BIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2509.

   Research: 1. Mating behaviour and communication (esp acoustics) of aquatic invertebrates. 2. Evolution of mating strategies in aquatic invertebrates. 3. Ecology and life history strategies of aquatic beetles. 4. History of evolutionary biology.

4. **ALEXANDER, D. ROSS.** BSc (Guelph, Fish & Wildlife); MSc (Guelph, Fisheries). FISH AND WILDLIFE SCIENCES. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6226 Fax: (506) 857-7732.

   Research: Currently acting as Chief, Fish Habitat & Enhancement Division, Science Branch, Gulf Region. No direct research but responsibilities in program planning and habitat policy development. Administrative responsibilities in fish habitat improvement, fish stock enhancement and ecological interactions (e.g. potential environmental impacts of construction of a NB-PEI fixed link crossing). Previous research included gaspereau stock assessments, trout stock assessments, trout broodstock development and lake inventory. I currently have some involvement in development of a DFO Gulf Geographic Information System.

5. **BAERLOCHER, FELIX JACOB.** Dipl sc nat (Zurich); PhD (Waterloo). MICROBIAL ECOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2512 Fax: (506) 364-2262.

   Research: I'm interested in interactions between microorganisms and invertebrates during the decomposition of organic materials in marine and freshwater environments. This includes the formation and use of seafoam, the fate of Spartina detritus, and the role of hyporheic biofilms in streams. The main emphasis, however, is on stream fungi and their effect on behaviour and nutrition of freshwater invertebrates. The potential use of fungal exoenzymes by animals, the nutritional suitability of various sources of organic nitrogen compounds and the genetic similarity of fungal strains isolated from different regions or at different times are being investigated.

6. **BARCLAY, LAWRENCE** ROSS COATES. BSc, MSc (Mt Allison); PhD (McMaster). CHEMISTRY. Dept of Chemistry, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2369.

   Research: The Physical-Biochemistry of Model and Natural Biomembranes. 1. Kinetics of free radical reactions in bilayers and micelles. 2. Effects of peroxidation on the bilayer structure (e.g. using 31P NMR) and permeability properties of phospholipid membranes. 3. Natural and synthetic antioxidants. The antioxidant efficiency and co-antioxidant interaction of vitamin E, vitamin C and sulfhydryl compounds. 4. The antioxidant capacity of biological fluids; including the effects of physical stress and smoking on human blood plasma.

7. **BATES, STEPHEN** S. MSc (City U of NY, Biology); PhD (Dalhousie, Oceanography). BIOLOGICAL OCEANOGRAPHY. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 858-3982 Fax: (506) 857-7732.

   Research: My major interests are with the physiological ecology of marine phytoplankton. In the past I have used sulfur-35 and in vivo chlorophyll a fluorescence induction as tools to determine the physiological condition (growth rate, rate of photosynthesis) of phytoplankton. Currently, I am interested in understanding the causes of phytoplankton blooms that produce toxins such as domoic acid. This involves both field and laboratory work. In the laboratory, my goal is to determine the factors (e.g., nutrients, temperature, irradiance, salinity) that control the growth of the pennate diatom Nitzschia pungens, and the production and release of the neurotoxin, domoic acid by this diatom. The laboratory work helps to direct the search for bloom-controlling factors in the field.

8. **BEATTIE, MARGARET.** PhD (Queen's, Math). MATHEMATICS. Dept of Mathematics and Computer Science, Mount Allison University,

Sackville, NB E0A 3C0. Tel: (506) 364-2540.

Research: Over the next three years, I plan to pursue problems in group-graded rings, and rings acted on by Hopf algebras.

9. **BEAUDRY, DANIEL.** MD. MEDICINE. Georges L Dumont Hospital, 330 Archibald St, Moncton, NB E1C 2Z3. Tel: (506) 382-2903.

Research: I participate in a drug evaluation for FISONS.

10. **BEGIN, JEAN.** BSc (Laval, Forestry); MSc (Laval, Silviculture). FORESTRY. School of Forest Science, Université de Moncton - Centre universitaire Saint-Louis-Maillet, 165 Hebert Blvd, Edmundston, NB E3V 2S8. Tel: (506) 735-8804 Telex: 014-45510.

Research: Research activities include: a) site index curves; b) growth and yield modelling; c) study of relationship between site and yield; d) forest measurement and forest inventory; and, e) log scaling.

11. **BELLIVEAU, PAUL E.** BSc, MSc (Moncton, Chemistry); PhD (Dalhousie, Chemistry). LIMNOLOGY. Water Quality Branch, Environment Canada, PO Box 861, Moncton, NB E1C 8N6. Tel: (506) 857-6606 Fax: (506) 857-6608.

Research: Applied limnological studies of surface waters in the Atlantic Region. Focus is on the impact of anthropogenic activities on various rivers and lakes, such as, the impact of agricultural and forestry practices on surface water quality.

12. **BENDER, BRUCE LEONARD.** BSc; MD; MAdmin in progress. MEDICINE. Moncton Hospital, 135 MacBeath Ave, Moncton, NB E1C 6Z8. Tel: (506) 857-5306 Fax: (506) 857-5312.

Research: I am interested in the discipline of medical administration and will be working on a thesis regarding the sociology of medical care expectations in the U.S. and Canada as well as a project on the economics of physician reimbursement in N.B. over the next year. This is a change for me, as my previous publications have been on various aspects of pathology.

13. **BENFEY, TILLMANN J.** BSc (McGill, Biology); MSc (Memorial, Biology); PhD (UBC, Zoology). ZOOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4583 Fax: (506) 453-4599.

Research: The ongoing objective of my research is to study the basic physiology of triploid fish, thereby addressing some fundamental questions in various fields of biology, e.g., evolutionary biology (how did polyploidy arise and how was it maintained among natural populations? what advantages were conferred upon polyploids over diploids?), physiology (what is the importance of cell size and number? how do animals compensate for or cope with changes in cell size and number?), developmental biology (how are cell numbers regulated?), reproductive biology (what input do the gonads have on higher centers involved in maturation and spawning?), and behavioural biology (do absolute cell numbers in the nervous and sensory systems influence learning ability, aggression, or mating success?). Triploid fish are ideally suited for this research because they have larger but fewer cells in all their tissues and organs, and because they are genetically sterile. This latter feature has a practical application, and a related, ongoing objective of my research is to assess the suitability of triploids for use as sterile fish for aquaculture and fisheries management.

14. **BENINGER, PETER.** BA (Western Ontario, Arts); BSc (Dalhousie, Biology); DEA, DSc (Bretagne Occidentale, Marine Biology). MARINE INVERTEBRATE ZOOLOGY. Dépt de Biologie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4227/4334 Fax: (506) 858-4541.

Research: I am engaged in two axes of research in two groups of organisms: nutrition and reproduction in bivalve molluscs and decapod crustaceans. Approaches include field ecology and functional anatomy, with an emphasis on structural and ultrastructural studies relating to ecological phenomena and resource management or aquaculture. Current research includes comparative dietary studies of crabs, structures and mechanisms of feeding in scallops and other bivalves, the relationship between nutritional pathways and good development in bivalves, and the functional anatomy of the crab reproductive system.

15. **BHAVSAR, VIRENDRA C.** BEngg (Pune, Electronics and Telecommunications); MTech, PhD (IIT Bombay, Electrical Eng). COMPUTER AND INFORMATION SCIENCES. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 NetNorth: BHAVSAR@UNB.CA.

Research: I am interested in supercomputers, parallel processing, supercomputing algorithm design and applications, computer graphics, VLSI computer architectures and neural networks. Current research work includes: a) design and analysis of vectorized and parallel Monte Carlo codes; b) supercomputing applications in Nuclear Particle Transport codes and computer graphics; c)computer graphics - visualization of fractals and their applications in modelling natural objects; d) VLSI architecture for pattern recognition; and, e) vectorization techniques for various program structures and studies on IBM 3090 series supercomputers.

16. **BIDEN, EDMUND N.** BScE (UNB); DPhil (Oxford). MECHANICAL

ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Biomechanics.

17. **BISSON, BARRY G.** BScE, MScE (UNB); MBA (Harvard). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Transportation and planning. Research interests include: a) highway cost allocation; b) regulatory reform in transportation, trucking and airline systems; and, c) transportation implications of free trade.

18. **BJERKELUND, THOMAS C.** BScF (UNB). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Forest operations.

19. **BOGHEN, ANDREW D.** MSc (McGill, Parasitology); PhD (Dalhousie, Biology). AQUACULTURE (Crustacean & Molluscan Physiology & Pathology). Dépt de Biologie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4334 Fax: (506) 858-4541.

Research: My research has evolved along 2 lines. 1. Crustacean Physiology: Work on snow crab and lobsters trying to understand molting and growth patterns (crabs) and trying to establish indices of pathology by employing various morphological (cell) and biochemical techniques (lobsters). 2. Molluscan Biology: Coordinating a pilot-scale monitoring project for the oyster industry in N.E. New Brunswick and examining various biological factors such as parasite fauna, glycogen control, condition index, etc. and making correlations with specific water parameters at various sites.

20. **BOITEAU, GILLES.** BSc (Laval, Biology); MSc (Laval, Entomology); PhD (NCSU, Agricultural Entomology). ENTOMOLOGY. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: I am interested in insect control, insect transmission of plant viruses and insect dispersal in agro-ecosystems. Some current projects include: a) biological control and chemical control of beetles and aphids on potato; b) epidemiology of aphid vectored diseases on potato; and, c) reproductive biology and ecology of the Colorado potato beetle.

21. **BONGA, JAN M.** PhD (McMaster, Botany). BOTANY, CYTOLOGY, EMBRYOLOGY, FORESTRY, GENETICS, PHYSIOLOGY. Forestry Canada -

Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3526.

Research: 1. Clonal propagation of conifers by tissue culture. 2. Conifer haploid tissue culture for somatic hybridization. 3. Conifer cytology.

22. **BONHAM, DAVID J.** BSc (Queen's); MEng, PhD (McMaster). MECHANICAL ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Computer-aided design and manufacturing; numerical control, (Manufacturing Technology Centre Inc).

23. **BOTTOMLEY, FRANK.** BSc (Hull, Chemistry); MSc (Hull, Analytical Chemistry); PhD (Toronto, Inorganic Chemistry); DSc (Hull, Chemistry). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4774 Fax: (506) 453-4599 NetNorth: BOTTOMLEY@UNB.CA.

Research: We are preparing organometallic oxides. These are large clusters of transition metal and oxide ions surrounded by organic ligands. The clusters have the magnetic properties of pure metal oxides (e.g. antiferromagnetism). They retain their structure and properties when dissolved in organic solvents such as toluene.

24. **BOURGOIN, ALLAIN.** PhD (Bretagne Occidentale, Océanologie biologique). BIOLOGIE MARINE. Université de Moncton - Centre universitaire de Shippagan, PO Box 2000, Shippagan, NB E0B 2P0. Tel: (506) 336-4761 Fax: (506) 336-9870.

Research: L'huître européenne Ostrea edulis présente une valeur commerciale élevée et nécessite un laps de temps plus court comparativement à l'huître américaine Crassostrea virginica pour atteindre une taille marchande. De ce fait, l'huître européenne semble donc une espèce de choix pour l'ostréiculture sur les côtes de l'Atlantique ouest. En collaboration avec le personnel de l'Aquarium-Centre marin de Shippagan, une étude a récemment été entreprise pour déterminer l'effet des basses températures sur la survie et la croissance de l'huître européenne.

25. **BOURQUE, CHARLES L.** BSc, MSc (Moncton); PhD (Dalhousie, Analytical Chemistry). CHEMISTRY, ENVIRONMENT. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4332 Fax: (506) 858-4541.

Research: Research involves the analysis of inorganic and organic contaminants by electrochemical means. Method development. Speciation of trace metal ions. Pesticides. Voltammetry and HPLC with EC detection.

26. **BRAY, DALE IRVING.** BScE (UNB, Civil Eng); MScE (UNB, Hydrology); PhD (Alberta, River Eng). ENGINEERING, HYDROLOGY, HYDRAULICS, GROUNDWATER STUDIES. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521 Fax: (506) 453-3568.

Research: Current research in groundwater studies is related to the re-evaluation of the geological history of the Fredericton Aquifer, a study of the chemistry of the water in the Fredericton Aquifer, and modelling of the physical aspects of flow in the Fredericton Aquifer. These studies are related to the work being done through the Groundwater Studies Group at UNB. Current research in river studies is related to the development of methods for estimating suspended sediment loads from ungaged watersheds in the Atlantic region. Work is essentially complete on the topic of influx of sand-sized material into an open gravel framework.

27. **BREMNER, THEODORE WILLIAM.** BSc (UNB, Civil Eng); MSc, PhD (London). ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521 Fax: (506) 453-3568.

Research: Research activities include: a) durability of concrete in sea water; b) microstructure and performance of concrete; c) strength and durability of lightweight concrete; d) alkali-aggregate reaction; e) application of plastics and composites for building construction and marine uses; and, f) investigation of performance of materials.

28. **BREWER, DOUGLAS G.** BA, PhD (Toronto). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4781 Fax: (506) 453-4599.

Research: General analytical chemistry problems relating to our environment. Examples from the past include studies on: a) fenitrothion, the pesticide used for spruce budworm spraying; b) various organic pesticides/fungicides used on soils on golf courses; and, c) thermochemical analysis of gaseous combustion products in fire-retardant polymers.

29. **BROOKS, WENDELL V. F.** (retired) BA (Swarthmore, Chemistry); PhD (Minnesota, Physical Chemistry). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. 218 Colonial Hts, Fredericton, NB E3B 5M1. Tel: (506) 459-5573.

Research: Molecular vibration and rotation, force constants, normal coordinate analysis, centrifugal distortion applied to small molecules (5 to 10 atoms usually).

30. **BROWN, GORDON DEREK.** BSc (Birmingham, Industrial Fermentation); PhD (Birmingham, Applied Biochemistry). FOOD SCIENCE AND TECHNOLOGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-1379 Fax: (506) 452-1395 Envoy: NBFRP.ILL.

Research: Commercially applicable research and development.

31. **BRUCE, DARRYL.** MS, PhD (Penn State). PSYCHOLOGY. Dept of Psychology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2455 NetNorth: TA52@UNB.

Research: Memory - 1. Investigations of memory for personal events. 2. Investigations of frequency estimation.

32. **BRUN, GUY L.** MSc (Moncton, Chemistry). CHEMISTRY. Water Quality Branch, Environment Canada, PO Box 861, Moncton, NB E1C 8N6. Tel: (506) 857-6606 Fax: (506) 857-6608.

Research: Work of the Water Quality Laboratory consists in providing analytical services and advice for a number of applied research projects and studies dealing with the long range transport of airborne pollutants (i.e. acid rain and toxins), toxic chemicals (agricultural and industrial) and ground/surface water quality monitoring. We have a general interest in the development of sensitive and selective techniques for the measurement of various inorganic parameters (such as major ions and trace metals) and trace organic contaminants such as pesticides, herbicides and other toxic industrial chemicals in aquatic substrates.

33. **BURGESS, JOHN PHILIP.** BSc, MSc (UNB); PhD (London); DIC (Imperial College). ENGINEERING - ELECTRONICS. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561 Fax: (506) 453-4599 NetNorth: JPB@UNB.CA.

Research: Research activities include: a) computer-aided design of circuits and systems; b) VLSI (very large scale integrated circuits); and, c) electronic instrumentation.

34. **BURKE, KENNETH B. S.** BSc (Mining Eng); PhD (Leeds, Applied Geophysics). GEOPHYSICS. Dept of Geology, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4804 Fax: (506) 453-5055.

Research: My major research interest is the seismicity of the Atlantic Provinces. Current projects include investigations of historical earthquakes in New Brunswick, studies of microseismic activity in the Miramichi epicentral region and a neotectonic study in the Passamaquoddy Bay region using marine and land geophysical data. I am also interested in the application of exploration geophysics to the solution of geological problems, particularly those involving near surface materials.

35. **BURRIDGE, LESLIE ERIC.** BSc (Dalhousie, Biology). TOXICOLOGY. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Current research in toxicology includes acute chronic effects of organic contaminants to marine and freshwater fish and invertebrates. Tests conducted include: acute lethality studies, bioaccumulation, and tests for various sublethal indicators of stress. Compounds of interest are pesticides, P.A.H.s and recently, natural toxins such as PSP toxins and domoic acid.

36. **BURRIDGE, ROBERT E.** BSc (UNB); MS (Wisconsin); PhD (McGill). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Power apparatus.

37. **BURT, MICHAEL DAVID BRUNSKILL.** BSc, PhD (St Andrews). ZOOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4692 Fax: (506) 453-4599.

Research: Research interests in parasitology have developed in a number of different areas including platyhelminth evolution, helminth ecology, parasite morphology and ultrastructure, the use of parasites as biological tags to monitor movements of their host species and, most recently, an in depth study of the life cycle and population dynamics of the seal worm, Pseudoterranova decipiens and related marine anisakines such as Contracaecum oscultum and Anisakis simplex. In addition, through the establishment of successful in vitro cultures of P. decipiens, studies are also being made of its reproductive physiology and response to chemotherapeutic drugs. Recently, graduate students have studied such diverse topics as: the use of fish parasites as biological tags (salmon, trout, herring, cod); larval digenean tegument ultrastructure; swimmers' itch in New Brunswick; the ecology of Parelaphostrongylus tenuis in deer and moose in N.B.; and the biology of certain Monogenea, Digenea, and Cestoda. Much of the information gleaned from our various studies has thrown light on our understanding of ontogeny and phylogeny in the platyhelminths and some revisions are being made to the previously suggested evolutionary pathways from free-living to the various parasitic forms.

38. **BUSBY, DANIEL G.** BSc (Manitoba, Zoology); MSc (Manitoba, Zoology - Ornithology). WILDLIFE BIOLOGY. Canadian Wildlife

Service, Environment Canada, PO Box 1590, Sackville, NB E0A 3C0. Tel: (506) 536-3025 Fax: (506) 536-3028.

Research: Toxic Substances Project: 1. Objective is to determine the effects of toxic substances on wildlife in Atlantic Region and, where unacceptable effects are known, to find biological and administrative solutions. Focus in recent years has been on the effects of aerial application of forest insecticides on songbirds and on long term trends of persistent chemicals in the marine environment. 2. Additional cooperative research has been done on problems encountered by birds inhabiting orchards and other intensively managed agricultural lands, and on the effects of forestry practices (other than the use of pesticides) on migratory birds. 3. New efforts are being channelled into implementation of the Canadian Environmental Protection Act. Activities will include definition of priorities for study, review and establishment of projects to monitor levels of toxic substances in the environment, and research in areas where more information is needed.

39. **BUSH, ROY S.** BSc (Alberta, Agriculture); MSc (Alberta, Animal Nutrition-Biochemistry); PhD (Manitoba, Animal Nutrition-Biochemistry). LIVESTOCK NUTRITION. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260.

Research: The newborn ruminant animal has all four parts of its multichambered stomach in place but only the abomasum of true stomach is functional. My research program is examining the changes that occur to the rumen during the first 2 months of life. This involves comparative analysis of the rumen tissue's enzymes levels and measurements of in vitro metabolism. The amount of fibrous feed consumed is one of the factors involved in controlling the rate of rumen development whereas consumption of cereal based diets controls overall animal growth and the effective age for early weaning. Therefore, we have been measuring factors that influence both grain and forage consumption in the very young animal.

40. **CAIRNS, DAVID K.** BSc (UPEI, Biology); MSc (Laval, Biology); PhD (Carleton, Biology). BIOLOGY. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 858-2072 Fax: (506) 857-7732.

Research: 1. Fisheries ecology - Development of methods for predicting herring recruitment, investigations of herring migration, study of dynamics of predation on herring eggs. 2. Seabird ecology - Modeling energy use by seabird and food consumption by higher marine predators, population dynamics of seabirds in relation to marine resources.

41. **CAISSIE, DANIEL.** BASc (Moncton, Engineering); MASc (Moncton,

Hydrology). HYDROLOGY. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6287 Fax: (506) 857-7732.

Research: I am interested in the effects of hydrology on fish habitats and production. Current research includes: a) development of a quantitative model to describe the relationship between fish habitat/production and environmental factors for variety of aquatic systems in the Gulf Region; b) the assessment of controlled manipulations and natural fluctuations of physical environmental factors on fish habitat and production, as part of an Experimental River Programme; and, c) identification and evaluation of groundwater dynamics in selected Gulf river systems with respect to their influence on local hydrology and fish production.

42. **CANT, PAUL GEORGE.** BSc (McMaster, Physics); MSc (McMaster, NMR); PhD (Nottingham, NMR). PHYSICS. Dept of Physics, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2580.

Research: Measurement and analysis of local tides. Theoretical models of settling of particles suspended in liquids.

43. **CASHION, PETER JOSEPH.** BSc (Boston College); PhD (Tufts, Biochemistry). BIOCHEMISTRY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6192 Fax: (506) 453-4599.

Research: Chemical synthesis of DNA relating to the affinity column isolation of fibronin mRNA; use of hydrophobic trityl agarose columns for the immobilization of stabilization of enzymes; use of trityl agarose affinity columns for the purification of mRNA.

44. **CHAPLIN, ROBIN A.** BScE, MScE (Cape Town); MSc, DIC (London); PhD (Queen's). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Power plant engineering. Simulation of transient behaviour, including steam generators, steam or hydraulic turbines, and process control systems.

45. **CHEVRIER, GERALD E.** BSc, MSc (McGill, Agriculture). AGRICULTURE. Dept of Agriculture, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2108 Fax: (506) 453-7978.

Research: Research activities are related to extension needs in the farming community. Most research of this nature can be applied directly at the farm level. Examples of ongoing areas of research: a) cultivar evaluations - dry bean and processing

tomato cultivars; b) organic production - weed/vegetable crop competition, Mycorrhizal innoculation in vegetable transplants; c) fertilization trials - tomato; d) plastic/ground mulch trials - cucumber; e) early season crop production - broccoli, cabbage, cauliflower; and, f) double cropping systems - carrot/celery.

46. **CHIASSON, ALYRE GERMAIN.** BSc (St FX, Biology); MSc (Manitoba, Zoology); PhD (UBC, Fisheries). FISH AND WILDLIFE SCIENCES. Dépt de Biologie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4030 Fax: (506) 858-4541 NetNorth: CHIASSA@UDEM.

Research: I am currently conducting research on the adaptations of fish to conditions found in tidal streams. This includes: a) feeding behaviour; b) vision; and, c) respiration.

47. **CHOUINARD, GHISLAIN A.** BSc (Moncton, Biology); MSc (Mt Allison, Biology). FISH POPULATION DYNAMICS. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6220 Fax: (506) 857-7732 Telex: 014-2607.

Research: The long-term objectives are firstly to provide an annual assessment of the status of the cod (Gadus morhua) stock in the southern Gulf of St. Lawrence. The assessment forms the basis of biological advice to resource managers on catch levels for this stock. Secondly to conduct biological studies to provide a solid foundation to assessment of the resource. Current studies include: a) effect of density and other factors on growth of cod; b) the use of juvenile surveys to predict recruitment; and, c) feeding of cod and impact on other commercial species.

48. **CHRISTIAN, A. JOHN.** BEng (Sheffield); MICE, CEng (Inst of Civil Engineers, London); PhD (Bradford). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Structural, construction, and the development of expert systems.

49. **CHRZANOWSKI, ADAM J.** BSc, MSc, PhD (Poland, Surveying). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5149 Fax: (506) 453-4943.

Research: 1. Development of new methods and techniques for engineering and mining surveys. Main topics of the current research are: a) integrated Analysis and Interpretation of deformation surveys (dam deformations, ground subsidence, slope stability) using the methodology developed at UNB; b) integration of geodetic and geotechnical measurements in deformation monitoring; c) prediction of ground subsidence in mining areas using the non-linear elastic finite element analysis; d) optimisation of geodetic networks for engineering projects; e) adaptation of high precision geodetic surveys into industrial metrology; and, f) use of the Satellite Global Positioning System in engineering surveys. The research results are implemented in industry. Notable involvements are: a) integrated analysis of deformations at the Mactaquac generating station; b) ground subsidence studies in oil fields in Venezuela; c) prediction of ground subsidence at the potash mines in New Brunswick; and, d) precision adjustment of a nuclear accelerator for the Atomic Energy of Canada.

50. **CLAIR, THOMAS A.** BSc (Mt Allison, Biology); MSc (Ottawa, Biology); PhD in progress (McMaster, Geology). LIMNOLOGY. Water Quality Branch, Environment Canada, PO Box 861, Moncton, NB E1C 8N6. Tel: (506) 857-6606 Fax: (506) 857-6608 NetNorth: TCLAIR@MTA.

Research: 1. Design and data interpretation of water quality monitoring networks. 2. Geochemistry of natural organic acids in freshwaters. 3. Acid precipitation effects on freshwaters.

51. **CLARK, MERVYN C.** BSc (UNB, Biology); PhD (UNB, Biochemistry). MOLECULAR BIOLOGY. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: The current focus of my research is on the use of recombinant DNA techniques for developing highly sensitive and specific hybridization probes for the detection of both latent and low grade bacterial infections of the potato. These same techniques are also being used in mapping genes in the potato, based on RFLP'S and in the identification of potato cultivars by DNA finger-printing.

52. **CLARKE, STEPHEN JOHN.** BSc (Bath, Materials Science); MSc, PhD (UMIST, Corrosion Science and Engineering). ELECTROCHEMISTRY, METALLURGY, CORROSION. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1359.

Research: Current research includes: 1. Determining the relationship between metallurgy and current efficiency of extremely high purity magnesium for use in the cathodic protection industry. 2. Characterising the hydriding behaviour of zirconium alloys and relating this to electrical properties of autoclaved zirconium oxides. 3. Characterising the corrosivity of fossil fuel ashes, in order to predict potential boiler life.

53. **CLAY, DOUGLAS.** BSc (Guelph, Fish and Wildlife Science); PhD (Reading, Aquaculture). FISH AND WILDLIFE SCIENCE, ECOLOGY.

Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6218 Fax: (506) 857-7732.

Research: Marine stock assessment scientist working on white hake and tuna. Current research directed towards identifying factors influencing distribution and movement of marine groundfish populations and basic biology of commercial species (fecundity, growth, feeding).

54. **CLAYDEN, STEPHEN ROBERT.** BSc (Mt Allison, Biology); MSc (Montreal, Plant Ecology); PhD in progress (London, Lichenology). BOTANY, ECOLOGY, SYSTEMATICS. Natural Sciences Division, New Brunswick Museum, 277 Douglas Ave, Saint John, NB E2K 1E5. Tel: (506) 658-1842 Fax: (506) 658-1842.

Research: Current research projects include: a) developmental and reproductive biology, systematics and biogeography of the lichen genus Rhizocarpon; and, b) inventory of the lichen flora of the Maritime Provinces.

55. **CLAYTOR, ROSS RICHARDSON.** MSc (Guelph, Fish & Wildlife). FISH AND WILDLIFE SCIENCES. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6250 Fax: (506) 857-7732.

Research: Stock identification of Atlantic salmon, relationship between freshwater life-cycle and sea-age of returning Atlantic salmon.

56. **COLEMAN, SHIRLYN E.** BSc (Western Ontario, Botany); MSc (Western Ontario, Plant Science). AGRICULTURE-PLANT TISSUE CULTURE. Dept of Agriculture, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2717 Fax: (506) 453-7170.

Research: Evaluations and trials related to maximizing the efficiency of tissue culture production procedures for such crops as potatoes, strawberries, gooseberries and fiddlehead ferns. Current trials include evaluation of various media and growth room conditions to maximize microtuber production from 5 major North American varieties of potatoes.

57. **COLEMAN, WARREN KENT.** BA, PhD (Western Ontario, Botany). AGRICULTURE, BOTANY. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: Current research in plant physiology involves 3 areas: a) physiology of potato tuber dormancy with particular emphasis on finding an environmentally acceptable method of reducing dormancy duration; b) water relations of Solanum species in order to identify drought resistant germplasm and to determine mechanisms of drought tolerance or resistance; and, c) evaluation of winter injury in fruit trees and the development of management techniques for detecting as well as ameliorating tissue injury.

58. **COOK, ROBERT H.** BSc (McGill, Agriculture); MSc (Dalhousie, Marine Biology); PhD (Dalhousie, Oceanography). BIOLOGY, FISHERIES SCIENCES. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-4517 Fax: (506) 529-4274.

Research: The St. Andrews Biological Station conducts research on the marine fish and invertebrate fisheries resources of the Bay of Fundy - Gulf of Maine area, on aquaculture and on the marine environment. In addition to serving as Station Director with involvement in the above fields, my personal research interests are in the following areas: a) the impacts of aquaculture on the marine environment; b) salmonid aquaculture development; and, c) socio-economics of aquaculture.

59. **COOMBS, DAVID H.** BA (Dartmouth, Biology); PhD (UCLA, Molecular Biology). MOLECULAR BIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4812 Fax: (506) 453-4599.

Research: We are probing the structure and function of bacteriophage T4 and are developing a method to determine its in vivo assembly pathway. Methodologies include SDS-PAGE, CTEM, STEM, centrifugation, immuno probes, colloidal gold, chemical cross-linkers and radioactive tracers. We are also investigating the role of papilloma virus in the etiology of cervical carcinoma. We suspect the viral E6 and E7 genes are the causative agents, so we are cloning them into expression plasmids and introducing them into eukaryotic cells to observe and quantify changes in cellular morphology and transformation.

60. **COOPER, RODNEY H.** MMath (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Rodney Cooper researches in the field of cryptography, the theory of coding systems for data security in database management systems. His research in this field is principally algebraic and involves the theory of finite fields, quaternions and linear algebra. He also has a deep interest in practical implementation of databases. Areas being investigated are the application of artificial intelligence, graphics, and large scale databases to the problem of power rerouting during crises such as storms, client tracking in the alcohol and drug rehabilitation programs, and the study of hereditary factors in the growing of potatoes. Cooper has a strong interest in inter-disciplinary work and is involved in the application of software to research projects in Latin Classics and Shakespeare.

61. **CORMIER, PAUL.** BSc (Moncton, Biology). BIOLOGY. Aquarium and Marine Centre, PO Box 1010, Shippagan, NB E0B 2P0. Tel: (506) 336-4771 Fax: (506) 336-9646.

Research: Mon travail comme biologiste est orienté principalement sur le développement de l'ostréiculture. Je suis impliqué dans des activités telles: a) prédiction de la chute du naissain; and, b) evaluation de différents sites d'élevage, etc. Présentement, je suis également impliqué dans un projet d'écloserie-pilote à l'Aquarium et Centre marin de Shippagan. Ce projet a pour objectif de solutionner un des problèmes majeurs que fait face l'industrie ostréicole au Nouveau-Brunswick soit un manque d'approvisionnement régulier en naissain.

62. **COUNTS, REBECCA L.** BSc (McMaster); **PhD (Manitoba). ECOLOGY,** GENETICS. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6193 Fax: (506) 453-4599.

Research: Research interests focus on evolutionary genetics and ecology of natural plant populations. The synthesis of concepts from the fields of population genetics and ecology allows studies on alternative adaptive strategies and factors affecting evolutionary change. The genetic parameters of interest are levels of variability within and among population, levels of heterozygosity and heterosis, mating systems, developmental plasticity, and heritability. Ecological factors of interest are reproductive and dispersal dynamics, population structure, successional role, niche breadth and temporal and spatial patterns of environment variability. At present, studies have centered around the evolutionary ecology of wild rice.

63. **COUTURIER, MICHEL F.** BScE (UNB); SM (MIT); PhD (Queen's). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Fluidization including: Fluidized bed coal combustion and sulfur dioxide capture in fluidized bed combustion.

64. **COWAN, FREEMAN BRIAN MATTHEW. BA** (Queen's); MA, PhD (Toronto). PHYSIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6194 Fax: (506) 453-4599.

Research: How can Malademys terrapin survive in distilled water or salt water indefinitely? It is a partial osmoconformer but salt glands are used to maintain plasma Na+ under 220 meg (-1 when in sea water. The function of these glands, as model of ion secreting epithelia is studied. The process of ion secretion is poorly understood. We have preliminary evidence that the gland synthesizes a glycoprotein which is used in the control of ion secretion, and this aspect is being studied as it relates to cystic fibrosis which appears to induce a derangement of ion secretion and glycoprotein content of exocrine glands. When in fresh water, plasma sodium concentration drops to 140 meg (-1. This extreme variation would have profound effect on the cardiovascular system in mammals. We are studying this aspect, and to date have found no effects. Why?

65. **CUMMING, BRUCE GORDON.** BSc (Reading); PhD (McGill). PHYSIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6196 Fax: (506) 453-4599.

Research: Plant propagation and the control of growth, organogenesis and development.

66. **CUNJAK, RICHARD ANTHONY.** BSc (Guelph, Marine Biology); MSc (Memorial, Biology); PhD (Waterloo, Biology). FISHERIES BIOLOGY. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 858-2002 Fax: (506) 857-7732.

Research: My research involves the study of fish habitat in freshwater and estuarine systems and particularly for salmonid fishes. Specific projects include: a) development of an Experimental River Basin (Catamaran Brook, Miramichi) for a multi-disciplinary approach to the study of aquatic habitat and those factors impacting upon it (e.g. logging activity, sedimentation, inter-annual variability, hydrological aspects); b) winter ecology in stream ecosystems; and, c) use of estuarine habitats by different species and life-stages of fish.

67. **CUNNINGHAM, ANNE CHRISTINE.** BSc (Michigan, Chemistry); MA (Emory, Math); PhD (Emory, Math). MATHEMATICS. Dept of Mathematics and Computer Science, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2645.

Research: I am interested in combinatorial designs, especially in applications of Steiner Triple systems.

68. **CWYNAR, LES C.** BSc, MSc, PhD (Toronto, Botany). PALAEOECOLOGY, PALAEOCLIMATOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6197 Fax: (506) 453-4599 NetNorth: CWYNER@UNB.

Research: Basic research interests lie in the reproductive ecology of arctic-boreal plants and the palaeoecology of arctic-boreal regions. Current reproductive ecology projects include the demography of arctic lupines and their regulation of maternal investment. Current palaeoecological projects include: a) the postglacial migration of trees into Beringia; b) testing the hypothesis that the warmest period in the central Yukon during present interglacial occurred between 11,000 and 9,000 BP, as predicted by the Astronomic Theory of glacial/interglacial climate change; c) applying simple population growth models to the postglacial expansion of black and white spruce in the Yukon; and, d) relating genetic and morphological attributes of modern populations of black and white spruce to their population and migration histories.

69. **DAIGLE, JEAN-YVES.** BSc, MSc (Moncton, Chemistry); PhD (UNB, Organic Chemistry). AGRICULTURE, BIOCHEMISTRY, CHEMISTRY, FORESTRY. Peat Research and Development Centre Inc, Université de Moncton - Centre universitaire de Shippagan, PO Box 2000, Shippagan, NB E0B 2P0. Tel: (506) 336-9719 **Fax:** (506) 336-9834.

    Research: Main research activities: a) behaviour of peatlands; b) extraction of peat; c) uses of peat and peatlands; d) development of new peat-based products; and, e) afforestation of cut over peatlands.

70. **DANISCH, LEE A.** MSc (MIT, Electronic Eng). ENGINEERING. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 **Fax:** (506) 452-1395.

    Research: I am interested in low-energy plasma reactions for the active trapping of effluents from low-pressure chemical vapour deposition processes. Research has included the development of a "Post Reaction Chamber" and its application to the removal of toxic and pyrophoric effluents resulting from the thermal decomposition of reagents including phosphine, silane, deborane, dichlorosilane, ammonia, and organo-silanes. This technology is of interest mainly in the semiconductor industry. Other interests include the application of fuzzy logic to control and data acquisition systems, and the development of optoelectronic sensors.

71. **DAVAR, KERSI S.** BE (Poona); MIE, PhD (Colorado). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

    Research: Research activities include: a) water resources; b) hydrology; c) fluid mechanics; and, d) research on flow in ice-covered rivers.

72. **DAVIES, HUW G.** BSc, PhD (Imperial College, London, Mathematics). ENGINEERING. Dept of Mechanical Engineering,

University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513 Fax: (506) 453-5025.

Research: Oscillation of nonlinear systems. Random vibration of nonlinear systems - probability density functions, statistics. Modulated and random response near bifurcations. Applications to engineering structures.

73. **DAWE, JOHN L.** BSc (Memorial); BEng (Nova Scotia Technical College); MSc, PhD (Alberta). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Structures and solid mechanics; masonry infill panels, structural steel sections and superstructure-foundation-soil interactions.

74. **DE JONG, HIELKE.** MSc (Kansas State, Horticulture); PhD (Wisconsin, Plant Breeding & Plant Genetics). AGRICULTURE. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 ext 4823.

Research: Breeding and genetics of potato on diploid level. Ploidy manipulations up and down the ploidy scale. Incorporation of marker genes in suitable genetic and breeding stocks. Potato cultivar development and evaluation.

75. **DEKSTER, BORIS V.** PhD (Leningrad Branch of Steklov Institute, Mathematics). MATHEMATICS. Dept of Mathematics and Computer Science, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2536.

Research: The proposed research has a few objectives which are not closely related. One of them, in a general form, can be described as follows. Consider an n-dimensional Riemannian manifold M^n and let $[k_1,k_2]$ be the range of its sectional curvature. Let $r>0$ be such that each geodesic shorter than r is a shortest path in M^n. Let $L=(l_{ij})$ be a matrix that can serve as the matrix of mutual distances of n+1 points. What is R depending on n, k_1, k_2, l and r? John Wilker and I established R for Euclidean and hyperbolic spaces ($k_1=k_2=k<0$, r=infinity). For the spheres, we found only a portion of R. I plan to find the missing portion. I hope also to get some results for the general manifold M^n. Another objective is to extend the concept of body of constant width W with some results in this area to M^n making certain assumptions and satisfying certain conditions.

76. **DERENYI, EUGENE EMERY.** Dipl Ing (Hungary, Surveying Eng); MSc (UNB, Geodesy); PhD (UNB, Photogrammetry). INFORMATION SCIENCES, ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5143 Fax: (506) 453-4943.

Research: The objective is to develop a computer aided decision support system for environmental and resource management. The Vector Image Processor (VIP) facility will perform integrated processing of digital map data, stored in geographic information systems and digital image data, acquired by earth resources satellites or by airborne sensors. It will establish an intelligent map/image linkage and provide for knowledge-based data analysis. The implementation of such a system will furnish decision makers with timely and accurate information on the earth's resources and the environment.

77. **DIDUCH, CHRISTOPHER P.** PhD (UNB, Electrical Eng). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 455-3669.

Research: The research focuses on the design and implementation of digital feedback control systems that possess failure detection and accommodation schemes. Current research activities include: a) design of feedback control systems that are insensitive to modelled effects; b) digital implementation issues such as sample period selection and computation effects; c) on line measures of relative stability; and, d) failure detection and isolation.

78. **DILWORTH, TIMOTHY GEORGE.** BSc (Ohio State, Wildlife Management); MSc (UNB, Wildlife Biology). WILDLIFE SCIENCES. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6199 Fax: (506) 453-4599.

Research: Wildlife ecology (small mammals and game species), fire-wildlife relationships, ecology of wildlife diseases.

79. **DOIRON, SYLVIO.** BSc (Moncton, Biology). AQUACULTURE, BIOLOGY. Aquarium and Marine Centre, PO Box 1010, Shippagan, NB E0B 2P0. Tel: (506) 336-4771 Fax: (506) 336-9646.

Research: Our concern is to develop the oyster culture in New Brunswick. Survey eleven areas of one acre on the east coast of New Brunswick to evaluate the mortality, the growth and the quality of oyster cultured. We also do the oyster spatfall monitoring in Caraquet Bay in order to permit local oyster growers to acquire seed to place on their private leases.

80. **DORAISWAMI, RAJAMANI.** BE (Bombay); ME (Indian Institute of Science, Bangalore); PhD (John Hopkins). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Control systems, power systems and signal processing.

81. **DOUGLAS, ROBERT A.** BASc (Windsor); PhD (Southampton). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

    Research: Geotechnics and forest roads.

82. **DRIEDZIC, WILLIAM.** BSc (York); MSc (Toronto); PhD (UBC). BIOCHEMISTRY, PHYSIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2506.

    Research: My research group is interested in defining the metabolic events which serve to supply energy for the work processes in heart and skeletal muscle. We are interested in exploiting the comparative approach and use an array of animals in our studies, especially marine and fresh water fish. Current projects in the laboratory include: a) impact of acute and chronic temperature changes on contractility in heart; b) role of myoglobin in oxygen delivery to muscle; and, c) premigration hypertrophy of flight muscle in shore birds.

83. **DRUMMOND, HUGH L. L.** BA, MA (Cambridge, Mechanical Sciences Tripos i.e. Engineers). ENGINEERING. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395.

    Research: Research activities include: a) design of special purpose machinery and tools, plastic injection molds, metal stamping and forming tools for press-work, and high pressure system design; b) robotics; c) high pressure water jet cutting; d) stress analysis; e) strain guaging, brittle lacquer testing; f) optical lens systems; and, g) non destructive testing - ultrasonics, eddy current and acoustic emission.

84. **DUNN, TODD.** BS, MS (Washington, Geology); PhD (Alberta, Geology). EXPERIMENTAL IGNEOUS GEOCHEMISTRY. Dept of Geology, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4804.

    Research: Current research includes: 1. Experimental determination of trace element crystal/melt partition coefficients in MORB and C/A systems. Applications are modelling of magma genesis and fractionation. 2. Experimental determination of major and trace element diffusivities in silicate melts. Applications are to provide data to help understand crystal growth/dissolution mechanisms, develop a better understanding of the T_1X_1 and P dependencies of activity-composition relationships in silicate melts. 3. Elucidate the kinetics of diffusion limited mass transfer in silicate melt systems.

85. **EIDT, DOUGLAS C.** BSA, MSA (OAC, Entomology); PhD (Saskatchewan, Biology). ENTOMOLOGY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3551 Fax: (506) 452-3525.

Research: 1. Entomophilic nematodes for insect control. Specifically for Hylobius congener, a weevil attacking seedlings in forest cutovers, particularly in central N.S. and against spruce budmoth which attacks and deforms white spruce in plantations, particularly in northern N.B. 2. Effects of forest pesticides on non-target aquatic invertebrates. Most recently in bog ponds, historically in streams. 3. Post-spray efficacy of spruce budworm sprays of fenitrothion and B.T. as affected by weather.

86. **ESTABROOKS, EVANS N.** BSc (McGill, Agriculture); MSc (Guelph, Horticulture). AGRICULTURE. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: Overwintering and improving productivity and management of perennial fruit crops through cultivar selection and crop management. This includes the identification and methods for reduction of temperature, moisture and nutrient stress of horticulture crops.

87. **EVELEIGH, ELDON SPENCER.** BSc, MSc (Memorial, Biology); PhD (Toronto, Ecology). ECOLOGY, ENTOMOLOGY, PATHOLOGY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3539 Fax: (506) 452-3525.

Research: I am interested in the population biology of forest insects. My current research involves ecological studies on the population dynamics of the spruce budworm. The purpose of these studies is to improve our understanding of the mechanisms underlying spruce budworm outbreak-collapse processes through detailed studies on the major mortality factors affecting the budworm (i.e., its natural enemy complex-parasites and diseases). The ultimate aim is to find effective biological control methods.

88. **FAIG, WOLFGANG.** Dipl Ing (Stuttgart); MSc (UNB); Dr Ing (Stuttgart). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Photogrammetry; engineering surveying, including mine subsidence measurements; industrial metrology.

89. **FELLOWS, DAVID M.** PhD (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400,

Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Fellows' current work is in the area of operating system design, performance measurement and modelling. He is also interested in simulation of discrete and continuous systems.

90. **FENSOM, DAVID STRATHERN.** BASc (Toronto, Chemical Eng); FRSC (UK); FRSA, LLD (Dalhousie). AGRICULTURE, BIOPHYSICS, BOTANY, FORESTRY, PHYSIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2503.

Research: 1. The application of biophysical techniques in forestry of agriculture to assess viability by simple tests. These include: a) the use of electrical resistance or capacitance measurements to monitor tree health thus discriminating between healthy trees and those dying through drought or rot; b) the use of electrical tests to monitor water content in silage samples; and, c) the use of ion uptake tests to assess viability of tissue in various plants both healthy and under stress. 2. The measurement of movements of ions or organic material (photoassimilates) in living plants in order to elucidate the mechanisms of transport occurring in these plants: a) by using short-lived isotopes of carbon (^{11}C) or nitrogen (^{13}N); b) by using transducers on veins or leaves to measure small changes in thickness; c) by using the pressure bomb or thermocouple psychrometer to measure water potentials; d) by using ^{14}C with metabolic conditioners to follow uptake and transport across membranes or through plasmodesmata; and, e) to monitor viability of varieties of winter wheat combining HPLC analyses for amino acids with tracer techniques.

91. **FERGUSON, LAING.** BSc (Edinburgh, Geology); PhD (Edinburgh, Palaeoecology). PALAEONTOLOGY, PALAEOECOLOGY, BIOMETRICS. Dept of Geology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2311 Fax: (506) 364-2262.

Research: 1. My research in the field of Invertebrate Palaeontology and Palaeoecology is concerned with problems involving both ontogenetic changes and phenotypical and/or preservational influences on those morphological features used in classification or taxonomy. Such studies have been applied mainly to Brachiopods (especially Productids) and Ostracods and have been restricted to Upper Paleozoic forms. In the case of Ostracods my studies are mainly concerned with two smooth-shelled genera (Bairdia and Paraparchites) where the various instars or moults have been classified (wrongly) as distinct species. The situation is further complicated by sexual dimorphism. It is hoped that the end result will be to clear up some of the taxonomic tangles in these two upper Paleozoic genera (and in relevant stratigraphy) and to instill a saner attitude towards the discrimination of genera and species of ostracods in general. In the case of productid brachiopods the ontogenetic development of spinosity has been found to have a relationship to the animal's ability to maintain a certain life position. Spine arrangements which have been used by others to distinguish genera appear in some cases to be controlled by the nature of the substrate and the animal's position in the sediment during its growth. 2. I am also interested in Upper Paleozoic plant fossils and in the ecological conditions of Carboniferous forests such as are found at Joggins, N.S. 3. Palichnology (the study of trace fossils) is also a subject in which I am interested.

92. **FINDLAY, JOHN ANTHONY.** BSc, PhD (UNB, Natural Product Chemistry); PDF (Cambridge). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4792 Fax: (506) 453-4599.

Research: My research is focused on the isolation and structural determination of natural products of biological interest. Part of this activity involves marine organisms, particularly echinoderms (starfish and sea cucumbers), while another project is concerned with the isolation and identification of compounds from fungi which are toxic to the spruce budworm.

93. **FLEMING, LESLEY CAROLYN.** BA (Mt Allison, Biology/English); PhD (UNB, Biology). HISTOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 459-0690 Fax: (506) 453-4599.

Research: Present research includes the examination of crystal structure of tooth enamel using light and electron microscopy, and radioautographic techniques. Prior research and ongoing interests include the study of turbellariaus and nemerteans of lobster, crabs (various), mussels, clams, oysters, using light and electron microscopy. Histology and systematics of Turbellaria and Nemertea.

94. **FOWLER, DONALD PAIGE.** BScF (UNB, Forestry); MS, PhD (Yale, Forestry). FORESTRY, GENETICS. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3529 Fax: (506) 452-3500.

Research: Carry out research to determine the amount and pattern of genetic variation available in tree species or hybrids of current or potential importance for planting in the Maritimes region. Develop tree improvement strategies that can be followed by forest managers (provincial and industrial) to mass produce genetically improved trees for their reforestation programmes.

95. **FRANCIS, RALPH M.** BScE, MScE (UNB). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Structures.

96. **FRITZ, JANE.** BSc (McGill); MSc (UNB, Computer Science). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Jane Fritz's main interest is in the full scope of concerns related to the automation of business information systems. Her other major interest is in the application of computers in education.

97. **GAUTHIER, DIDIER.** BSc (Sherbrooke, Biology); MSc, PhD (Laval, Biochemistry). BIOCHEMISTRY. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4355 Fax: (506) 858-4541.

Research: My current research deals with the study of protein synthesis. A first aspect is the analysis of the interaction at protein synthesis with the cytomatrix. I am interested to show the molecular mechanism of this association as well as its role into the regulation of protein synthesis. Another topic is the relationship of protein synthesis and some diseases impairing brain development. Currently, I am studying the effect of experimental phenylketonuria (and other aminoacidopathies) on brain protein synthesis. The techniques currently used in my laboratory are: polyribosome sedimentation analysis (sucrose gradient), cell-free protein synthesis (in vitro incorporation), immunodetection of protein after gel electrophoresis, etc.

98. **GAVARIS, STRATIS.** BSc (UNB, Biology and Statistics). FISHERY ASSESSMENT AND MANAGEMENT. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Current activities involve resource assessment of groundfish stocks and research on the population dynamics of groundfish. The purpose of this work is to provide the basis for advice on the management of groundfish fisheries.

99. **GIROVARD, FERNAND E.** BSc (St Joseph); PhD (Notre Dame, Physics). PHYSICS. Dépt de Mathématique, Physique et Informatique, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4339 Fax: (506) 858-4541.

Research: Current research is on the optical and electrical properties of solids and thin films. Expertise includes vacuum techniques, thin film deposition, electrical properties of materials, electrochromic systems, and optical properties of solids and thin films.

100. **GLOSS, GERHARD H.** Ing (Stuttgart, Surveying); BSc (Delft, Photogrammetry); MSc (Laval, Cartography). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698 Fax: (506) 453-4943 NetNorth: SE@UNB Telex: 014-46-202.

Research: Urban Cartography. Development of recommendations for urban mapping procedures mainly for developing countries. Work is carried out within the Commission On Urban Cartography of the International Cartographic Association.

101. **GODDARD, MARCUS V.** BSc (Queen's); PhD (UNB). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Catalysis, including deactivation and diffusional resistances by the formation of carbonaceous deposits in commercial FCC catalysts. Also, product distribution and coke deactivation of new FCC catalysts.

102. **GODIN, JEAN-GUY J.** BSc (St FX, Biology); PhD (UBC, Zoology). ZOOLOGY - BEHAVIOURAL ECOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2507 Fax: (506) 364-2262.

Research: My current research programme focuses largely on the behavioural ecology of predation (foraging) and antipredation in aquatic animals, with particular emphasis on fishes. Ongoing research includes investigations of trade-offs between foraging and predator avoidance behaviours, competition for food under the risk of mortality to predation and benefits and costs of schooling behaviour.

103. **GOLDFARB, LEV.** Dip Math, CS (Leningrad); PhD (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Main research interests are in the foundations of artificial intelligence, pattern recognition, machine learning, and computer vision, as well as in the design of associated intelligent (expert) systems and associated parallel computer architecture.

104. **GOSZCZYNSKI, JAREK.** BSc (Warsaw, Engineering); MSc (Warsaw, Design Engineering); MSc (Drexel, Electrical & Mechanical Eng).

DESIGN MECHANICAL ENGINEERING AND MATERIALS. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395 Envoy: NBFRP.ILL Telex: 014-46115.

Research: The main area of expertise is Non-Destructive Testing and Evaluation of such materials as: metals (ferrous and non-ferrous), powder metallurgy materials, concrete, composite materials, plastics, wood, ceramics and other using such techniques as: a) high and low frequency ultrasonic using both immersion and contact methods employing longitudinal, shear (horizontally and vertically polarized), surface and Lamb waves; b) eddy current; c) radiography; d) magnetic particles; e) liquid penetrants; and, f) flow measurement. Typical material and joints (welds, glue lines, etc.) inspection and analysis are made taking into consideration such discontinuities in parent material or joint as: surface and subsurface cracks, inclusions, delaminations, lack of fusion and penetration, grain size changes due to heat processes, anisotropy of material with determination of principal axes of anisotropy, etc. Each inspection is accompanied by analysis to characterize flaws with respect to such parameters as type of the flaw, size, shape, orientation, location and classification. Also part of expertise is designing new inspection methods, equipment and procedures with full practical and theoretical analysis. Recent research had involved designing of method and building equipment for in-reactor proximity measurements between horizontal flux detectors and calandria tubes (COG, NBPC), analysis and improvement of existing methods of in-situ inspection of high temperature turbine bolts/studs (CEA) or designing method and procedure for in-situ inspection of pole bolts (NBPC). Future research will include welds and composite materials using F-maping and 3-Dimensional ultrasonic imaging.

105. **GREIN, FRIEDRICH.** BSc, MSc (Goettingen, Physics); PhD (Frankfurt, Theoretical Chemistry). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4776 Fax: (506) 453-4599 NetNorth: FRITZ@UNB.CA.

Research: Research in theoretical chemistry, using ab initio SCF and CI methods, with the following interests: a) visible/UV spectroscopy of di- and triatomic molecules; b) study of positive and negative ions for determining ionization potentials and electron affinities; c) stereoelectronic effects in acetals and esters, as well as protonated acetals and esters; d) proton affinities of selected molecules; e) molecular complexes and clusters; and, f) modeling of chemical reactions by combining ab initio with force field methods.

106. **GUJAR, UDAY G.** BE (Poona); MTech (IIT/Bombay); MScE (UNB). COMPUTER SCIENCE. School of Computer Science, University of New

Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Design and implementation of computer graphics systems. Generation and manipulation of three dimensional objects. 3-D objects from 2-D views. Interpolation techniques. Geometric and algebraic fractals. Applications of fractals in modelling natural objects. Applications of computer graphics. Design and analysis of vector algorithms for Monte Carlo methods. Supercomputer applications in radiation transport and graphics. Interactive computing and internals of systems.

107. **GUPTA, RAMESHWAR D.** MSc (Meerut, Statistics); MA (Dalhousie, Mathematics); PhD (Dalhousie, Multivariate Analysis - Statistics). STATISTICS. Division of Mathematics, Engineering and Computer Science, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5624 NetNorth: GUPTA@UNBSJ.

Research: At present I am working on research problems in Multivariate Statistical Analysis, Statistical Inference, and Statistical Reliability Theory.

108. **HAGEN, DONALD WARREN.** BS, MSc (Texas); PhD (UBC). POPULATION GENETICS. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6204 Fax: (506) 453-4599.

Research: Empirical testing of the theory of natural selection. In particular, the adaptive value of phenotypic variation and polymorphism in species of stickleback (fish).

109. **HALCROW, KEVIN.** BSc (Manchester, General Science); MSc (Dalhousie, Biology); TC (Southampton, Education); PhD (Dalhousie, Oceanography). ZOOLOGY. Dept of Biology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5567.

Research: My research deals primarily with the development, structure and properties of the crustacean integument. I am currently investigating the epidermal wound response as a potential model for normal cuticle deposition. The intent is to use this model to investigate topics such as the control of cuticular fibril orientation and of cuticle thickness.

110. **HAMID, MOHAMED.** BSc (Cairo, Mechanical Eng); MSc (Cranfield, Mechanical Eng). ENGINEERING. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395.

Research: Application of computer in manufacturing. Automation, and computer integrated manufacturing

111. **HANNAH, GERALD WALLACE.** BSc (Mt Allison); BEng (NSTC, Electrical Eng); MEng (NSTC). ENGINEERING. Dept of Engineering, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2580.

Research: Application of computer-aided design methods, and of artificial intelligence methods and expert systems in engineering education.

112. **HANSON, ALAN REGINALD.** BSc (Mt Allison, Biology); MSc (Western Ontario, Zoology). FISH AND WILDLIFE SCIENCES. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2440 Fax: (506) 453-4279.

Research: Current research involves: a) incidence of lead shot in sediments and waterfowl in New Brunswick; b) Black duck - Mallard morphology and hybridization; c) greater scaup breeding biology; and, d) wetland productivity and assessment.

113. **HARRIES, HINRICH.** MSc, PhD (Rutgers, Soil Science). BOTANY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2502.

Research: Succession and recent degradation of epiphyte vegetation including: bryophytes, lichens, algae, and sooty mould fungi.

114. **HAWKES, ROBERT LEWIS.** BSc (Mt Allison, Physics); MSc (Western Ontario, Physics); BEd (Mt Allison); PhD (Western Ontario, Physics). ASTRONOMY. Dept of Physics, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2580 Fax: (506) 364-2262 NetNorth: A014@MTAM.

Research: I am primarily interested in study of the physical characteristics of meteoroids, and to a lesser degree their parent objects (comets and asteroids). In addition I am interested in atmospheric effects produced by extraterrestrial dust. Observationally we study faint meteors using image intensifiers coupled to sensitive video cameras, and digital image processing techniques. Theoretically we model the ablation of dust grains using numerical methods (e.g. Runge-Kutta) to solve the differential equations of motion. In addition we do work on the modelling of meteoroid streams over long time periods (as a way of estimating the ages of comets), and are beginning a project on the possibility of satellites bound to cometary nuclei or asteroids.

115. **HAYA, KATSUJI.** BSP, PhD (UBC, Pharmaceutical Sciences). TOXICOLOGY (AQUATIC). Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: 1. Toxins produced by marine phytoplankton can reach undesirable concentrations during annual blooms. This project is concerned with the impact of toxin producing phytoplankton blooms on wild and cultured fin fish and shellfish industries. The objectives are to: a) identify the lethality of marine phytotoxins to fish; b) determine the movement of phytotoxins through food webs; c) develop techniques for the detection and quantification of toxins; and, d) improve prediction and detection of toxic algal blooms and the accumulation of toxins in shellfish. 2. This project is concerned with the development of biochemical indicators of health in aquatic organisms. Current emphasis is on the identification of biochemical indicators of sublethal effects caused by the exposure of aquatic animals.

116. **HETU, DANIEL.** BSc (Sherbrooke, Chimie); MSc, PhD (Sherbrooke, Chimie-Physique). CHEMISTRY, PHYSICS. Université de Moncton - Centre universitaire de Shippagan, PO Box 2000, Shippagan, NB E0B 2P0. Tel: (506) 336-4761 Fax: (506) 336-9870.

Research: In a general way, I am interested in the study of the thermodynamic properties of colloidal systems, aiming at a better understanding of the behavior of hydrophobic compounds in these kinds of systems. More specifically I am in the process of studying about the effect of polar head groups of surfactants on the penetration of alcohols, and benzene in micelles and interactions between pesticides and micelles. I am also interested in the adsorption properties of peat moss, which could replace activated carbon in many applications such as in the environmental field.

117. **HICKLIN, PETER WILLIAM.** BA (Mt Allison); BSc (Acadia); MSc (Acadia, Zoology). ZOOLOGY, ECOLOGY. Canadian Wildlife Service, Environment Canada, PO Box 1590, Sackville, NB E0A 3C0. Tel: (506) 536-3025 Fax: (506) 536-3028.

Research: 1. Bioenergetics and Feeding Ecology of Coastal Birds. 2. Conservation of North American migrant shorebirds. My research concentrates on habitat requirements and foraging ecology of coastal birds (Common Eider, Double-crested Cormorant and Semipalmated Sandpiper) in relation to the accumulation and storage of nutrient reserves in the form of lipids and proteins. How lipid and protein reserves are allocated during periods of energy stress such as for long-distance migration and egg production is the main focus of my research activities. I devote a considerable amount of my working hours towards protecting critical habitats for migrant shorebirds in North and South America.

118. **HILDEBRAND, ELDO EARL.** BSc (Waterloo, Civil Eng); PhD (Waterloo, Civil Eng). CIVIL ENGINEERING. Dept of Civil

Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521 Fax: (506) 453-4568 NetNorth: ELDO@UNB.CA.

Research: The long term aim of research in the highway and pavement areas is to develop a better knowledge of pavement performance issues relevant to Atlantic Canada. Current research involves four related areas: a) development of pavement design methods appropriate to New Brunswick climate, traffic, and materials; b) field measurements of vehicle impacts on pavement structures using instrumentation installed in the highway pavement; c) analysis of the pavement material properties related to the development of premature ruts in flexible pavements; and, d) development of a pavement management system appropriate to smaller municipalities.

119. **HILL, EUGENE F.** BSc, MSc (UNB); PhD (N Carolina State). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Power systems, including power system harmonics.

120. **HINDS, HAROLD ROYALL.** BS (Massachusetts, Biology); MA (Smith College, Botany). BOTANICAL SYSTEMATICS, FLORISTICS, FLORA OF NB. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4583 Fax: (506) 453-4599.

Research: 1. Distribution of vascular plants of New Brunswick. 2. Protection of areas of natural and scientific interest in New Brunswick. 3. Status reports on endangered and threatened vascular plants in New Brunswick.

121. **HINDS, ROBERT P.** BSc (UWI, Agronomy); MSc (McGill, Soil Physics); MBA (McGill, Marketing/Finance). AGRICULTURE (SOIL SCIENCE). Dept of Agriculture, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2109 Fax: (506) 453-7978.

Research: 1. Current research is investigating the relationship between calcium (supplied through Gypsum) and yield, the incidence of scab and internal brown spot of potatoes. 2. Current research is also investigating the relationship between various calcium carriers (gypsum, calcium nitrate, calcium nitrate/urea, ammonium nitrate blends, etc.) on the yield and calcium content of the potato periderm as it affects storability of the crop.

122. **HORTON, JOSEPH D.** BSc (Manitoba); MA (York); PhD (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Main field of research encompasses many areas of Combinatorics, especially Design and Graph Theory. Other fields of research include Computational Geometry, Algorithm Analysis and Combinatorial Optimization. The most important recent research result is the discovery of a polynomial-time algorithm to find the shortest cycle basis of a graph. If this result can be extended to regular matroids, which seems likely, then it gives a polynomial algorithm to find the minimum representation (fewest nonzeros in the matrix) of the null space of any totally unimodular matrix. Other ongoing research includes several design problems (Self-orthogonal path designs with Gillian Nonay of Wilfred Laurier University, more bicovers with quintuples with R. C. Mullin of the University of Waterloo; the investigation of the T-Join polytope and related algorithms for finding T-joins with W. R. Pulleyblank of Waterloo), and the investigation of computational geometry algorithms in higher dimensions (with W. M. Stewart, PhD candidate).

123. **HSU, CHIMEI JAMES.** BSc (National Taiwan); MSc (National Taiwan/Memorial); PhD (Memorial). PHYSICS, OPTICS. Division of Sciences, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5539.

Research: My research interest is in the interaction between strong laser beams and matters. A two-level atomic (or molecular) system driven by a strong near resonant field forms a saturated system. I have found that such a system is not stable. When this system is subjected to a perturbation, it gives rise to radiations with some new characteristics. At the present time, I am investigating theoretically: a) wave mixing; b) collission effect and Doppler effect and other effects associated to such a system; and, c) the transient response to a probe in a general physical condition. A density matrix method will be employed and computer calculations and plottings are needed to display the results.

124. **HUIGE, GUSTAVUS E.** BSc (UBC, Math); MSc, PhD (NYU, Math). MATHEMATICS. Division of Mathematics, Engineering and Computer Science, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5621.

Research: Spectral theory of operators, in particular linear partial differential operators and pseudo differential operators.

125. **HURLEY, J. EDWARD.** BSc, MSc (UNB, Biology). MYCOLOGY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3515 Fax: (506) 452-3525.

Research: The Forest Insect and Disease Survey (FIDS) is responsible for the assessment of forest pest condition throughout the Maritimes. Though my work is not research related by definition the information provided is of direct benefit to government, corporate and public concerns. My responsibilities include the implementation of an annual work programme for the detection and evaluation of forest insect and disease conditions, the investigation of new or unusual forest pest conditions, the delineation of forest insect or disease outbreaks and the development and testing of new methods of pest detection and import assessment. Our work in FIDS is directed locally as a team effort and our mandate is carried out in five other regional federal forestry establishments across Canada.

126. **HUSSEIN, ESAM M. A.** BScE, MSc (Alexandria, Nuclear Eng); PhD (McMaster, Nuclear Eng). ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513 Fax: (506) 453-5025 NetNorth: HUSSEIN@UNB.CA.

Research: My research program is concentrated with the non-power applications of nuclear radiation. This includes developing methods for nondestructive testing and imaging of industrial and medical objects, radio-therapy planning and radioisotopy tracers. I am also interested in Monte Carlo simulation of particle and fluid transport and in applications of supercomputers. Current research includes: a) measurement of steam quality using neutron scattering; b) detection of explosive-like materials; c) nondestructive inspection of concrete structures; d) optimization of radiotherapy planning; e) Monte Carlo methods for modelling fluid flow; f) vectorization of Monte Carlo codes on supercomputers; and, g) Compton scatter imaging of tissue-like materials. I am also interested in providing solutions to the nondestructive testing and monitoring needs of the industry, particularly for hard-to-measure parameters and in limited access or harsh environments.

127. **INNES, J. DAVID.** BScE, MScE (UNB). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Transportation and planning. Research interests include accident investigation, highway cost allocation and truck costs and resources.

128. **IRCHA, MICHAEL C.** BSc, MPI, MPA (Queen's). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Transportation and planning, including urban and regional systems, municipal management, marine transportation and port administration, and the transportation implications of free trade.

129. **IRELAND, ROBERT JOHN.** BSc (Hatfield Polytechnic); PhD (London). BIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2504.

Research: 1. Metabolism of nitrogenous compounds in plants. 2. Effect of light on plant enzymes (molecular biology).

130. **IRETON, VERNE M.** BSc (Queen's). MECHANICAL ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Thermometric measurement of efficiency of hydraulic and fluid power machinery; energy conservation.

131. **JACOBS, CHERYL A.** BSc, MSc (UNB, Computer Science). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Investigated methods for recognition of hand-written characters and is adding to a software subroutine library which she previously developed to aid in research in this area. She has also done some work with Geographic Information Systems.

132. **JANKOWSKI, CHRISTOPHER K.** MSc (Warsaw, Chemistry); PhD (Montreal, Chemistry); DEtat (Paris, Physics). ORGANIC CHEMISTRY. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4310 Fax: (506) 858-4585.

Research: 1. Synthesis of natural products (alkaloids, sugars). 2. Relation between the tridimensional structure and physiological activity of organic molecules. 3. FAB (fast atom bombardment) of peptide spectra. 4. Cancer synthesis of potential anticancer agents. 5. Nucleic acids - platination of DNA and RNA, free folding of tRNA.

133. **JIBIKI, KYO.** BSc (Hokkaido, Metallurgical Eng); MASc, PhD (UBC, Metallurgical Eng). METALLURGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395.

Research: I am currently involved in a long term research project in which a technique to prevent scaling on metal surfaces is developed utilizing the electrochemical principle. Scaling is a problem encountered in various industries, i.e. mining, metallurgical, chemical and nuclear. Another project investigates in a pilot plant scale to recover nickel, copper and cobalt from a low grade ore found in N.B. Also I was involved in a project where a gold recovery process from a sulphide ore was investigated. The recovery of gold from sulphide containing ores is considered to be expensive and often uneconomical.

134. **JOHNSON, LEROY FRANK.** BScE (UNB); MMath (Waterloo, Computer Science). COMPUTER AND INFORMATION SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566.

Research: 1. Interested in information and data relationships. Present project is the design of a personal interface to PC with OS-2 to control access to resident software and data files. The C language and OS/2 provide the initial design platform. 2. Interested in design of intelligent interactive man/machine interfaces. Present project investigates use of colour in man/machine interfaces. 3. Algorithm analysis and design, with emphasis on information extraction from data models and databases.

135. **KACZMARSKA-EHRMAN, IRENA.** MSc (Jagellonian, Biology); PhD (Jagellonian, Botany). BIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2510 Fax: (506) 364-2262.

Research: 1. Pleistocene paleoceanography of the Indian Ocean; diatom response to the glacial/interglacial climatic cycles. 2. Cenozoic paleoceanography of the high productivity regions along the North America Continental Margin. 3. Late Holocene paleolimnology of the Lake Ontario and the Greandier Pond, Toronto, Ontario. 4. Phytoplankton composition and seasonality in two estuaries in the eastern Prince Edward Island with mussel farms. 5. Diatom inferred pH and heavy metal concentration in actual soft water lakes in Sudbury and Chapleau regions; timing, magnitude and dynamic of acidification and heavy metal influx during the last several hundred years. 6. Diatom inferred paleoclimatic fluctuations, paleoproductivity and Holocene evolution of the marl depositing lakes in Ontario. 7. Holocene history of salinification of northern Sahara lakes. 8. Distributional patterns of the genus Nitzschia and their significance as indicators of water masses involved in the formation of the Gulf Stream Warm Core Rings. 9. Stratigraphy of the Middle/Upper Miocene diatomite deposits and paleolimnology of the Harper Basin, Oregon, USA. 10. Structure and dynamic of living diatom communities in a variety of habitats (reservoirs, thermal waters, hanging gardens and streams) in Utah and Hawaii. 11. Tertiary, marine diatom bearing sediments from the Polish Flysch Carpathians; stratigraphy of the Menilite and Krosno beds of the Skole Basin; evolution of the basin, its paleoceanography and relationship to the Tethys and Northern Sea during Oligocene and Miocene. 12. Biometry of the Actinocyclus kuetzingii frustules. 13. Quaternary (Holocene, Late Glacial and Eemian) succession of the freshwater diatom communities; a paleoclimatic perspective.

136. **KARMAN, DENIZ.** BSc (Middle East Technical); MSc (Ege, Izmir); PhD (UNB). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Simulation, including the combustion and retorting properties of New Brunswick oil shale, radiation transfer in furnaces and combustors, and sulfur dioxide capture in fluidized bed combustion.

137. **KAYE, MARY E.** BSc (UNB); MEng (Carleton). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Digital systems.

138. **KEPPIE, DANIEL MACKENZIE IV.** BS (Wisconsin); MS (Oregon State); PhD (Alberta). WILDLIFE SCIENCE. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 7533 Fax: (506) 453-4599.

Research: 1. Processes that determine which individuals recruit successfully into local breeding populations, most recently using spruce grouse and woodcock as vehicles for study. Specifically, investigate for causes of production differences between populations (grouse); what are the attributes of males that do not acquire territory (grouse, woodcock)?; do non-breeding females exist (grouse)?; behavioural attributes of dispersal (grouse); maternal effects upon juvenile quality (grouse). 2. Interaction of forestry practices, site structure and animal populations. Specifically, differences in attractiveness among display sites of male woodcock in coniferous forests and effects from harvests; role of site variables in use of forest stands by animals; edge and ecotone concepts.

139. **KING, RUSSELL R.** BSc (Carleton, Chemistry); MSc (Carleton, Organic Chemistry); PhD (London, Organic Chemistry). ANALYTICAL ORGANIC CHEMISTRY. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260.

Research: Research activities are oriented towards providing a source of chemical and analytical expertise in multidisciplinary projects related to agricultural concerns. Current involvements focus on investigations regarding: a) the isolation and characterization of pest deterrent mucilages associated with the glandular trichomes of various wild Solanaceae species; b) structural elucidations of phytotoxins associated with Streptomyces scabies the causal organism of common scab potato; and, c) nutritional aspects of different potato varieties under North American and South American cultivation practices.

140. **KLEUSBERG, ALFRED.** Dipl Ing (Berlin); Dr Ing (Stuttgart). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Physical geodesy and satellite positioning.

141. **KRANK, MARVIN DOUGLAS.** BA (Indiana, Psychology & Mathematics); PhD (McMaster, Exp Psychology). EXPERIMENTAL PSYCHOLOGY, PSYCHOPHARMACOLOGY. Dept of Psychology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2463.

Research: 1. Expectancy and Drug Use: Experiments on animal and human subjects addressing the role of expectancy in drug consumption and drug effects. With animals expectancies are established via conditioning procedures and assessed using various behavioural and physiological techniques. With humans expectancies are pre-existing and are assessed by context manipulations and self-report. 2. Anticipation and Immunity: These studies investigate the regulatory role of anticipatory processes in the level of functioning of the immune system. Conditioning procedures are used to activate anticipatory reactions to chemotherapy drugs including cyclophosphamide and cyclosporine. Immune Function is assessed via antibody production in response to a benign antigen (SRBCs). Currently, we are developing the capability to measure interleukins which are the chemical signals between immune cells. The aim of this research is to isolate mediators of the regulatory effects.

142. **KRAUSE, MARGARIDA O.** BSc (Lisbon, Biology); MSc, PhD (Wisconsin, Cell Biology). MOLECULAR BIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4583 ext 6207 Fax: (506) 453-4599.

Research: I am interested in the mechanism of gene expression in eukaryotes, in particular the factors that are involved in the control of transcription of cellular oncogenes in normal and cancer cells. Current research in my laboratory involves the study of a class of small nuclear RNAs whose properties support the concept that they participate in transcription regulation. We have thus far identified two 7S RNAs which show sequence homology to promoter and enhancer regions of two cellular oncogenes. DNA copies of these RNAs have been cloned for further sequence and characterization of their role in the transcription process.

143. **KRISTMANSON, DAVID D.** BASc (UBC); PhD, DIC (London). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Fluid dynamics, including spray atomizer characterization and the dispersion and deposition of aerial spray. Mixing in natural ecosystems.

144. **KURZ, BERND J.** Dipl Ing (Stuttgart); MScE, PhD (UNB, Electrical Eng). COMPUTER AND INFORMATION SCIENCES. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 NetNorth: BJKUTZ@UNB.

Research: Current research and development in COMPUTER VISION is application oriented and centres around preprocessing and feature extraction methodologies for 2D and 3D images. Feature definition and related robust feature extraction for detection and measurement of man-made objects in natural scenes are under investigation. Several Prototype vision systems have been developed and implemented for automated tallying of lumber and for robotic vision for a surveying robot. Current research in color IMAGE PROCESSING deals with fundamental processing of pictorial information in a human vision context. Storage, transmission and display methodologies have been developed for data compression subject to visual fidelity criteria. The latest results show high data compression with satisfactory image fidelity.

145. **LANDVA, ARVID O.** BSc (Strathclyde); Dring (Norwegian Tech); PhD (Laval). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Geotechnical engineering specifically dealing with soft soils such as peat and landfills.

146. **LANGLEY, RICHARD BRIAN.** BSc (Waterloo, Applied Physics); PhD (York, Experimental Space Science). SURVEYING ENGINEERING, GEODESY. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5142 Fax: (506) 453-4943 NetNorth: LANG@UNB or SE@UNB.

Research: The research we are presently pursuing centres on improving the accuracy and ease with which relative positions can be obtained from Global Positioning System (GPS) phase observations. There is a need both in the geodynamics and engineering surveys communities for reliable, centimetre-level relative positions. GPS phase observations have the potential for fulfilling this need. But in order to produce such accuracies several of the error sources plaguing GPS phase observations must be better understood and modelled. We are addressing the present limitations of GPS by carrying out a research program with the following objectives: a) improve the models used to predict the tropospheric delay of GPS (and other satellite) signals; b) investigate the use of ionosphere models for processing single frequency data and modelling the residual effect of dual-frequency (first-order) corrections; c) extend our model for describing the orbits of GPS satellites to handle multi-day arcs and to use improved orbits thus generated to fix carrier phase integer cycle ambiguities on long baselines; and, d) study the effects of selective availability on precise relative positioning using carrier phase. The resulting models and algorithms will be incorporated into software for processing GPS phase observations. This resulting software product will be made available to the surveying industry to enable it to carry out high accuracy, cost-effective engineering surveys.

147. **LAVOIE, JACQUES.** **AGRICULTURE.** Dept of Agriculture, RR #2, Florenceville, NB E0J 1K0. Tel: (506) 392-6007 Fax: (506) 392-6189.

Research: 1. Study on the effect of curing temperature of the performance of clipping varieties during storage ("evaluate new chip cultivars at the field storage management level"). 2. Evaluation of new russet varieties, in relation to size distribution mainly for the count trade market.

148. **LAWTON, PETER.** BSc (Bradford, Environmental Science); PhD (Bangor, Marine Zoology). FISHERIES ECOLOGY. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Current research is directed towards understanding recruitment processes in the Bay of Fundy lobster population, with emphasis on early benthic-stage life history. Additional topics of concern are the interaction of aquaculture and traditional fisheries, and marine predator:prey dynamics.

149. **LEBLANC, PAUL V.** BSc (Moncton, Biology); BScAgr (Laval); MSc (Laval, Biologie végétale). AGRICULTURE. Senator Hervé J Michaud Experimental Farm, Agriculture Canada, PO Box 667, Bouctouche, NB E0A 1G0. Tel: (506) 743-2464 Fax: (506) 743-8316.

Research: My work involves different types of research projects on the production of vegetable crops. The first part of our trials is the evaluation of cultivar or species of vegetable crops that are more suited to New Brunswick. The second part consists in doing management trials such as fertility experiments, spacing trials, windbreak studies, crop production studies, etc.

150. **LEE, Y. C.** BSc (Simon Fraser); MSc, PhD (UNB). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Digital mapping and automated cartography.

151. **LENARD, JOHN G.** BASc, MASc, PhD (Toronto). MECHANICAL ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Theory of plasticity, metalforming processes, material properties and computer-aided manufacturing.

152. **LEUNG, CHI-HONG.** BSc (Hong Kong, Physics); PhD (Manitoba, Physics). PHYSICS. Division of Sciences, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5631 Fax: (506) 648-5528.

Research: My research is mostly on defects in solids. This includes: a) defects in simple metals - vacancy formation energy, volume, etc.; b) the Jahn-Teller effect in solids (mostly in the group-theoretical aspect); c) self-trapped excitons in solids; d) defect formation mechanism in alkali halides; and, e) electronic structure of defects in ionic crystals and rare gas solids. In addition, I have also worked in solid and liquid alloys.

153. **LEWIS, J. EUGENE.** BSc (UNB); PhD (UBC). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Microwave heating and guided wave studies, microelectronics (CADMI Microelectronics Inc), fiber optics.

154. **LIN, KWAN-CHOW.** BSc (Chu Hai Coll, Civil Eng); MScE (UNB, Civil Eng); PhD (Toronto, Civil Eng). ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521 Fax: (506) 453-3568.

Research: Research interests include: a) biological wastewater treatment (aerobic and anaerobic); and, b) water quality modelling (natural waters and biological reactors). Current research includes: a) potato-processing wastewater treatment; b) anaerobic processes: upflow anaerobic sludge blanket (UASB) reactor and, upflow anaerobic filter (UAF); c) mixing characteristics in biological reactors; d) mathematical modelling of biological reactors; and, e) optimization of treatment processes.

155. **LITTLE, C. H. ANTHONY.** BSc (UNB, Forestry); MF (Yale, Forestry); PhD (Yale, Tree Physiology). FORESTRY (TREE PHYSIOLOGY). Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3500 Fax: (506)

452-3525.

Research: My objective is to elucidate the mechanism regulating wood production in forest trees at the molecular level. Current research is investigating: a) the role played by plant hormones in controlling the annual cycle of activity and dormancy; b) the structure and organization of the cambial genome; and, c) the application of genetic engineering techniques to increase wood quantity and quality.

156. **LOGAN, ALAN.** BSc, PhD (Durham, Geology). ECOLOGY. Dept of Geology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5606 Fax: (506) 648-5528.

Research: Current research interests: 1. Systematics, ecology, life history and contribution to sediments of Recent cool-water brachiopods from Bay of Fundy, eastern Atlantic and Mediterranean. 2. Systematics, ecology and contribution to sediments of cryptic zone sessile invertebrate faunas in coral reefs, particularly brachiopod-bryozoan-sponge-foraminiferan communities and application of such data to paleoecological reconstructions. Areas of study include Bermuda, Barbados, Grand Cayman. 3. Geomorphology, communities, and sea-level history of modern Caribbean reefs and associated environments, particularly from Bermuda and the Cayman Islands. 4. Competitive interactions between reef organisms, particularly corals, from Bermuda. 5. Coral Growth studies, Bermuda and Barbados. 6. Sublittoral hard substrate communities from all depths in the Bay of Fundy: composition, development, distribution and limiting factors.

157. **LOVELY, DENNIS FENTON.** BSc (Southampton, EE); PhD (Strathclyde, Bio Eng). BIOMEDICAL ENGINEERING. Institute of Biomedical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4966 Fax: (506) 452-1040.

Research: My primary research activity is in the field of implantable telemetry systems. More specifically implantable systems for the myoelectric control of powered prostheses. In addition I am responsible for the majority of electronic instrumentation research and development currently underway at the Institute. This includes work with the TMS320 signal processor, isolated instrumentation systems and r f telemetry.

158. **LUFFMAN, MARGIE.** BSc (Guelph, Horticulture); MSc (McGill, Plant Science and Pathology). AGRICULTURE. Senator Hervé J Michaud Experimental Farm, Agriculture Canada, PO Box 667, Bouctouche, NB E0A 1G0. Tel: (506) 743-2464 Fax: (506) 743-8316.

Research: I am in charge of the fruit research programme at the

Senator Hervé J Michaud Experimental Farm; my research comprises both tree fruits and small fruits (berry crops). I am primarily concerned with evaluating fruit cultivars and types of fruit which are suitable for New Brunswick soil and climatic conditions. I am also interested in management techniques which will enhance productivity and winter hardiness.

159. **LUKE, DAVID MCG.** BScEng, MScEng (Natal). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Digital systems; electronics, including energy efficient motor drives, solar radiation monitoring and motor speed measurements.

160. **LYNCH, WILLIAM HENRY.** BSc, PhD (UBC, MIcrobiology). MICROBIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4733 Fax: (506) 453-4599.

Research: The research program involves studies on bacteria of importance as pathogens in cultured salmonid fish. Specifically, studies are being carried out on the surface structures and extracellular products of bacteria such as Aeromonas salmonicida, Renibacterium salmoninarum and Vibrio species and how these relate to virulence, antibiotic resistance, antigenicity and detection in fish tissues. The purpose of the research is to gain better understanding on how to detect and cope with these pathogenic microorganisms.

161. **MACAULAY, JOHN B.** BSc (UNB, Organic Chemistry); PhD (Alberta, Organic Chemistry). CHEMISTRY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395.

Research: In the Electroorganic Synthesis Section of the Process Chemistry Department, I carry out research and development of organic syntheses that utilize electrochemical processes as key steps. Target compounds for electroorganic synthesis include those that are produced industrially on a low volume/high cost scale, such as pharmaceuticals. Among the advantages of electroorganic synthesis are: low cost of redox reagent (electrons), selective chemistries achieved by electrode potential control, reduced pollution because stoichiometric quantities of conventional toxic reagents can be replaced with catalytic recyclable agents, and protection of technology by developing novel patentable routes that differ from existing conventional processes. I also contribute to the development of pest management programs in the Chemical & Biotechnical Services Dept by performing organic synthesis in the field of insect pheromones.

162. **MACFARLANE, JOHN T.** MSc (Montreal, Physics). PHYSICS. Dept of Physics, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2580.

Research: Study of glow discharge in noble gases. Under some conditions in argon for example the energy distribution is non maxwellian; it is interesting to understand the parameters which control the behaviour.

163. **MACLEAN, CATHERINE (CATHY) ANN.** BSc (Health Education); MD. MEDICINE. 860 Mountain Rd, Suite 400, Moncton, NB E1C 2R8. Tel: (506) 858-0440.

Research: Collecting data on patients seen in family practice who present with pneumonia. We are trying to determine causes of "walking pneumonia" in hopes of developing a rationale for antibiotics/treatments.

164. **MACLEAN, DAVID ANDREW.** BSc (UNB, Biology); PhD (UNB, Forest Ecology). FORESTRY, FOREST ECOLOGY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3580 Fax: (506) 452-3525.

Research: Research involves: a) determining the influence of spruce budworm defoliation on tree growth, mortality, and timber production of spruce-fir forests; and, b) developing methods to forecast wood production in stands or forests influenced by spruce budworm damage. I am quantifying effects of budworm defoliation in over 150 permanent sample plots in New Brunswick and on Cape Breton Island and relating growth loss and tree mortality to budworm population levels, cumulative defoliation, and tree stand and site characteristics. In addition, I am cooperating (with Canada Centre for Remote Sensing, University of Moncton, and Petawawa National Forestry Institute) in studies evaluating: a) Landsat Thematic Mapper data for predicting stand condition and future growth; and, b) an airborne Multi-spectral Electro-optical Imaging Scanner (MEIS) for assessing current-year spruce budworm defoliation.

165. **MAGASI, LASZLO P.** BScF (UBC, Forestry); MSc (UBC, Mycology); PhD (College of Forestry Syracuse, NY, Mycology/Forest Pathology). FOREST PATHOLOGY, FOREST ENTOMOLOGY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3516 Fax: (506) 452-3525.

Research: Assessment of forest pest conditions in the Maritimes, determination of the damage caused by these pests and work towards their control. The project involves development of new and improvement of old survey methods, studies of life cycles of insects/diseases, development and maintenance of insect collection, herbarium, culture collection, etc. Some of the pests under intensive study: Dutch elm disease, Gypsy moth, Scleroderris canber, Sirococcus shoot blight, Armillaria root rot, and decay fungi.

166. **MAHENDRAPPA, MUKKATIRA K.** BSc (India, Agriculture); MSc (Utah State, Microbiology); PhD (Utah State, Soil Chemistry). AGRICULTURE, FORESTRY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3549 Fax: (506) 452-3525.

Research: My main theme of research is on the dynamics of nitrogen (and various other nutrient elements) in the soils and their cycling between soil-plant-water continuum. Characterizing the nutrient cycling processes under different forest ecosystems have been carried out with the objectives of evaluating the impacts of various perturbations such as forest fertilization, air pollution-acid deposition and different forest management practices. At present, I am involved in a study aimed at evaluating the environmental impacts of intensive forest harvesting. Specifically in this study lysimeters are used to determine potential soil acidification and site degradation due to whole tree harvesting of large tracts of forest land.

167. **MALLET, JACQUES.** BSc (Moncton, Biology). BIOLOGY. Aquarium and Marine Centre, PO Box 1010, Shippagan, NB E0B 2P0. Tel: (506) 336-4771 Fax: (506) 336-9646.

Research: We are working in the evaluation and feasibility of a mussel industry on the North East Shore of New Brunswick: a) site selection; b) assisting and following the industry in their phase of implementation; c) collecting and evaluation of spat fall on long line system; d) evaluation of mussel growth versus density and type of stocking materials; e) evaluation of a new technique of growing mussels on long lines; and, f) collecting data in the field (e.g. temperature, salinity, pH, dissolve oxygen, chlorphyle a).

168. **MALLET, PIERRE.** BSc (Moncton, Biology); MSc in progress (Moncton, Biology). PHYSIOLOGY, HISTOLOGY. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 857-6048 Fax: (506) 857-7732.

Research: Current research on crustacean reproductive systems are under way, this includes histology of the male and female gonads as well as histology of eggs in order to follow the embryotic development. Other research on molt stage of the shore crab are performed. This includes histology of the cuticle in order to determine the time duration of each stage.

169. **MALLET, VICTORIN NOEL.** BSc, MSc (Moncton, Chemistry); PhD (Dalhousie, Chemistry). CHEMISTRY. Dépt de Chimie et

Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4333 Fax: (506) 858-4541.

Research: My field of research is analytical chemistry. I am particularly interested in organic contaminants such as pesticides, hydrocarbons, polyaromatics, polychlorobiphenyls and so on. My goal is to develop methods for the analysis of such contaminants in environmental substrates. To do so I utilize most of the chromatographic methods such as thin-layer, gas-liquid and liquid-liquid. I also use gas chromatography coupled to mass spectrometry both for identification of contaminants and their by-products as well as for quantitative purposes.

170. **MARTIN, JAMES D.** BSc (UNB, Biology). BIOLOGY. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Current research involves field studies, investigations and analysis of scallop spat settlement in relation to environmental parameters for stock assessment, enhancement and aquaculture development research. Also conduct studies towards the development of fisheries for underutilized invertebrate species which include population studies, gear evaluation, ecological and environmental relationships.

171. **MASRY, SALEM E.** BSc (Cairo); DUCL, PhD (London). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Digital mapping; automation in photogrammetry, including the use of inertial navigation systems.

172. **MATTHEWS, JAMES HORACE.** BSc (Mt Allison, Physics); MSc (Dalhousie, Physics); PhD (London, Nuclear Physics). PHYSICS. Dept of Physics, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-3581 Fax: (506) 364-2216.

Research: 1. Solar Energy Devices - Solar energy to heat devices (especially concentrators) and stratification in water storage units. 2. Monitoring Systems - Devices for monitoring energy flow in buildings, including data transmission by radio. 3. Sensors - Air velocity sensors.

173. **MCALLISTER, ANDREW J.** BA, MSc (UNB); PhD (Saskatchewan). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Research is currently centred around a project in the area of Computer-Aided Software Engineering (CASE). The primary objectives of this project are: a) to define an extension of the Structured Systems Analysis and Design software development methodology that enhances its use with automated development environments; and, b) to implement a CASE tool based on the enhanced methodology.

174. **MCALPINE, DONALD FRASER.** BA, MSc, PhD in progress (UNB, Biology). ZOOLOGY. Natural Sciences Division, New Brunswick Museum, 277 Douglas Ave, Saint John, NB E2K 1E5. Tel: (506) 658-1842 Fax: (506) 658-1842.

Research: I am interested in the ecology, biogeography and systematics of eastern Canadian frogs and their helminth parasites. Current studies are aimed at understanding the role of host behaviour and ecology in shaping the structure of anuran helminth communities, particularly in the light of recent suggestions that there are fundamental differences in the organization of parasite communities in fish and birds. Field and laboratory studies include examination of: a) age structure of host populations and growth of hosts in relation to prevalence, intensity, and seasonality of helminth infection; b) the influence of host microhabitat use in anurans in relation to parasite communities; and, c) the impact of anuran diet and foraging behaviour on parasitic helminth community structure. Minor but continuing research projects in zoology involve studies on the biogeography of various eastern Canadian vertebrates (amphibians, reptiles, certain groups of birds and mammals).

175. **MCKENZIE, JOSEPH ADDISON.** BA (McMaster); MA (Toronto); PhD (Western Ontario). BEHAVIOUR. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6208 Fax: (506) 453-4599.

Research: Ethology of fish including agonistic, courtship and communication. Migration and specialization in North Atlantic species of fish.

176. **MCLAUGHLIN, JOHN D.** BScE, MScE (UNB); PhD (Wisconsin). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Cadastral systems and land information management.

177. **MCQUEEN, RALPH E.** BSA (UBC, Agriculture); MSc (UBC, Animal Nutrition); PhD (Cornell, Nutrition). RUMINANT NUTRITION, FORAGE CHEMISTRY. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: Maximizing the use of forages to meet the nutritional requirements of lactating cows. Studies involve: a) kinetics of fibre fermentation in the rumen of lactating cows (in situ); b) chemical characterization of plant cell wall constituents (lignin-carbohydrate complexes, cellulose) in fresh herbage and that conserved by ensiling; c) developing laboratory procedures for predicting nutritive characteristics of forages (chemical, enzymatic, near infrared reflectance spectroscopy); and, d) fermentation of forage fibre (and woodwastes processes by lignolytic fungi) by ruminal microorganisms.

178. **MEHRA, MOOL CHAND.** Bsc, MSc (Rajasthan, Chemistry); DSc (Laval, Chemistry). CHEMISTRY. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4320.

Research: Analytical Chemistry. Methods development, trace metals analysis, inorganic species analyses. Particular interest toward application of current instrumentation toward environmental samples analysis. Development of newer reagents and study of chemical reactions potentially useful in trace analytical work.

179. **MENELEY, DANIEL A.** BScE (Saskatchewan); PhD, DIC (London). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Transient modelling of nuclear stations, local energy supply systems, safety design of power plants, overall risk of energy conversion.

180. **MENG, CHAO-HO.** BSc (Taiwan); MScF (UNB); PhD (Michigan State). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Forest operations research.

181. **MILLER, RANDALL FRANCIS.** BSC, MSc (Waterloo, Earth Sciences); PhD (Waterloo, Environmental Geology). PALAEOCLIMATOLOGY, PALAEONTOLOGY, PALAEOECOLOGY, . Natural Sciences Division, New Brunswick Museum, 277 Douglas Ave, Saint John, NB E2K 1E5. Tel: (506) 658-1842 Fax: (506) 658-1842 NetNorth: RFMILLER@SJ.UNB.CA.

Research: Current research involves the study of various aspects of climate and ecology of the Quaternary Period. Fossils, primarily beetle remains, are used to determine changes in climate during the past 100,000 years or more. Beetle fossils, recovered from terrestrial deposits, can be sensitive indicators of local ecological conditions and climate. Study sites are located in the Maritimes and Ontario. Research work also includes the identification and interpretation of associated invertebrate, vertebrate and plant fossils. Ongoing palaeontological research at the museum includes the examination of New Brunswick fossil material from Precambrian to Recent times, conservation of fossil specimens and a study of the history of geological investigation in New Brunswick.

182. **MITCHELL, ANDREW BAIRD.** BEng (Liverpool, Metallurgy); PhD (Manchester, Metallurgy). METALLURGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-1377 Fax: (506) 452-1395.

Research: Development of metals and materials for industrial use in operating plants such as pulpmills, nuclear and thermal generating stations, marine applications, etc. Development of non-destructive testing techniques for assessing degradation of piping and pressure vessels during service. Research into the deleterious effects of hydrogen on the properties of pressure tubes in nuclear reactors. Fracture of plastics and polymers.

183. **MORELAND, CHARLES.** BSc (London); Dip Chem Eng (Manchester); PhD (Birmingham). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Automatic control.

184. **MORGENSTERN, ERWIN KRISTIAN.** BScF (UNB, Forestry); MScF (Toronto, Forest Genetics); Dr rer nat (Hamburg, Forest Genetics). FOREST GENETICS. Dept of Forest Resources, University of New Brunswick, Bag Service #44555, Fredericton, NB E3B 6C2. Tel: (506) 453-4501 Fax: (506) 453-4599.

Research: During the last 20 years, Canadian reforestation programs have been greatly expanded. To assure a high genetic quality of the seed and planting stock, population genetic studies and applied breeding programs have been initiated in cooperation between various organizations across the country. My current research is concerned with the testing and selection of native and exotic species of larches and the development of selection indices for the native spruces and larches. Selection indices are mathematical equations that guide selection when several traits must be considered. Well designed field experiments (progeny tests) are the basis for this work and these are now becoming available for the major species.

185. **MORRIS, DAVID R.** BSc (Birmingham, Chem Eng); PhD (London, Chem Eng). ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: 1. Development of electrochemical sensors: a) sensor for monitoring hydrogen in gas mixtures; b) sensor for monitoring hydrogen and oxygen in water; and, c) sensor for monitoring hydrogen in steel. The basic design of this sensor is under patent application. 2. Studies of the energy and energy efficiency of industrial chemical processes. The purpose of energy analysis (which is based on the first and second laws of thermodynamics) is to identify locations of energy degradation within a process. Identification can result in improved efficiency of a process and reduction of energy consumption.

186. **MOSSMAN, DAVID J.** BSc, MSc (Dalhousie); PhD (Otago). GEOLOGY, GEOCHEMISTRY. Dept of Geology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 536-4110.

Research: Main research is the study of the geological processes involved in the formation of mineral deposits. Focus currently is on the formation of deposits of precious minerals and on the geology of the deposits themselves, particularly ancient (Precambrian) placer Au, U deposits. Associated research projects deal with aspects of mineralogy and especially with processes of biomineralization. Biomineralization is a process whereby metals and/or metallic compounds become concentrated in living organisms. As such, at least in some important instances, ore deposits may result. Hence my on-going interest in the role played by organic matter in the genesis of ore deposits.

187. **NARRAWAY, JOHN J.** MSc, PhD (Cranfield Institute of Technology). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Networks, digital systems, and control systems.

188. **NEEDHAM, TED.** BScFOR, MScFOR, PhDFOR (Virginia Polytechnic Inst & State). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Silviculture

189. **NEUFELD, ERIC.** BSc, MSc (Saskatchewan); PhD (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Current work focuses on models of automated reasoning based on mathematical logic and probability. In particular, much work has been done examining the relationship between "default" logics and standard probability theory. Other interests include probabilistic graph theory, in particular, network reliability.

190. **NEWBOLD, BRIAN TREVOR.** BSc (Manchester, Chemistry & Physiology); DSc (Laval, Organic Chemistry). CHEMISTRY. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4593/4331 Fax: (506) 858-4541.

Research: Currently my research activities are in the field of chemical education and concern the following projects: a) evaluation of microcomputer software for use in the teaching of chemistry at all levels; b) history of chemistry and its use for teaching purposes; c) integrated approaches to the teaching of chemistry at the university level; and, d) chemistry for the citizen. Earlier research activities were: a) chemistry of nitrocellulose and gun propellants; b) synthesis of substituted azo, azoxy, and hydrazobenzenes; c) studies on the Wallach rearrangement; and, d) purification of bile pigments (bilirubin; biliverdin).

191. **NICKERSON, BRADFORD GEORGE.** BSc, MSc (UNB, Surveying Eng); PhD (Rensselaer Polytechnic Institute, Computer Eng). COMPUTER AND INFORMATION SCIENCES. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 NetNorth: BGN@UNB.CA.

Research: Brad Nickerson has an interest in algorithms and data structures for the processing of two and three dimensional spatial data. His current research activities in this area include automated cartographic generalization and alternative data structures for map data. He also has research interests in the general area of expert systems. Areas being investigated include how to represent knowledge about spatial objects and spatial data inside an expert system, how to use expert systems for real-time applications, and how to effectively represent the knowledge within operating manuals in an expert system.

192. **NIGAM, PRAKASH CHANDRA.** BSc (Agra, Agriculture); MSc (Agra, Entomology); PhD (IARI, Insect Toxicology). ENTOMOLOGY - SPRUCE BUDWORM BEHAVIOUR AND CONTROL. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3574 Fax: (506) 453-3525.

Research: I am interested in the behaviour of spruce budworm larvae and characteristics of insecticides dispersion during and after aerial application, in order to increase the efficacy of insecticides and current control practices of B.t. and fenitrothion. The following aspects are under investigation: a) behaviour of spruce budworm larvae under different weather conditions during and after insecticide treatments; b) insecticide droplet characteristics after deposition from aerial application as affected by changes in shape of larvae microhabitat due to elongation of shoot and weather; c) effect of high concentration of active ingredient and rate of application (Low and ultra ultra low volume) on efficacy and efficiency of B.t. and fenitrothion; and, d) elucidating the mechanism by which dose transfer takes place to the larvae after deposition on the host.

193. **O'NEILL, HUGH J.** BSc (UNB, Chemistry). ENVIRONMENTAL QUALITY. Water Quality Branch, Environment Canada, PO Box 861, Moncton, NB E1C 8N6. Tel: (506) 857-6606 Fax: (506) 857-6608.

Research: Plan and implement aquatic field studies with respect to pesticides and toxic chemicals in the Atlantic region. Prepare reports to meet commitments under the Canada Water Act and Canadian Environmental Protection Act.

194. **PAIM, UNO.** BA, PhD (Toronto, Zoology). AQUACULTURE. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4584 Fax: (506) 453-4599.

Research: Primarily interested in the effects of directive environmental factors which enable terrestrial and aquatic animals to select their habitats, microenvironments and food. Secondarily, as time and facilities permit, studies are: the selection of spawning sites by landlocked Atlantic Salmon, temperature-controlled sheltering and selection of winter microenvironments by juvenile salmon, selective feeding by juvenile salmon, influence of temperature and soil gases on directed movements of adult and larval May beetles (Phyllophaga sp), directed emergence of wood-boring and soil insects, oviposition site selection by soil beetles, and modification of food-finding and feeding responses of echinoderms.

195. **PARKER, GERALD R.** BSc, MSc (Acadia). WILDLIFE BIOLOGY. Canadian Wildlife Service, Environment Canada, PO Box 1590, Sackville, NB E0A 3C0. Tel: (506) 536-3025.

Research: Presently involved in the study of juvenile Black Duck mortality and despersion by radio telemetry. Study area presently in southern New Brunswick. General area of research - waterfowl population ecology.

196. **PARKER, PHILIP A.** BScE (UNB); MSc (St. Andrews); PhD (UNB). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Bio-engineering, including myoelectric control systems.

197. **PATERSON, COLIN GARTH.** BSc, MSc (Alberta); PhD (Waterloo).

BIOLOGY. Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2513.

Research: 1. Evolution of Dystrophic lake ecosystems. 2. Ecology of Chironomidae and Unionidae. 3. Ecological significance of aggregation.

198. **PELLETIER, GHISLAIN J.** BScA (Laval, Agriculture). AGRICULTURE. Dept of Agriculture, PO Box 5001, Grand Falls, NB E0J 1M0. Tel: (506) 473-5515 Fax: (506) 473-6641.

Research: Current applied research in potato production involves: a) evaluation technologies for early potato production; b) crop management (spacing and fertility); and, c) demonstration acceleration of new technologies.

199. **PELLETIER, YVAN.** PhD (Pennsylvania State, Entomology). AGRICULTURE. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: I am interested in the insect/potato relationship, insect chemical ecology and aphid identification. More specifically, my research is oriented to study the relation between potato insect pests and the potato plant. Host finding mechanisms are studied using behavioral and electrophysiological techniques. The mechanism of resistance of other Solanum species is also investigated.

200. **PENDREL, BRUCE A.** BSc (Toronto, Biology); MSc (Toronto, Entomology). ENTOMOLOGY, FOREST HEALTH. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3543 Fax: (506) 452-3525.

Research: Development of methods for assessing forest insect and disease pests. Current research focuses on use of pheromone lures and host attractants. Research into specific pest problems to identify factors contributing to host damage and to test means of reducing the level of damage which occurs, through population control or the use of cultural practices and pest deterrents. Forest decline surveys, especially for hardwood species.

201. **PERRY, R. IAN.** BSc (UBC, Zoology); PhD (UBC, Zoology & Oceanography). OCEANOGRAPHY, FISHERIES SCIENCE. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: The long-term research objectives are to develop an understanding of oceanographic influences on the distributions, migrations, and recruitment of commercial fish populations, particularly those of the Scotian Shelf and Gulf of Maine (including the Bay of Fundy and Georges Bank). This involves developing methods for determining suitable environmental conditions for various species and stocks, and prediction of the biological response should these conditions change. Representative projects include variations in the timing of the spring phytoplankton bloom and its impact on young fish survival; the influence of tidal fronts on fish distributions; and the potential impacts of global climate change to the fisheries of Atlantic Canada.

202. **PETERSON, RICHARD HARRY.** BSc, MSc (UNB, Biology); PhD (Carleton, Biology); PDF (Illinois, Physiology & Biophysics). ZOOLOGY, PHYSIOLOGY. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: I do research on behaviour and physiology of early life stages of fish. My behavioural research encompasses behavioural responses of early life stages to environmental perturbation (e.g. acid rain). My physiological research involves study into the mechanisms by which inorganic ion movements among various compartments of the teleost egg are controlled. I also do research on culture methods of early life stages of marine fish to establish optimal conditions for development and growth.

203. **PHAM-GIA, THU.** PhD (Toronto). APPLIED STATISTICS, MANAGEMENT SCIENCE. Dépt de Mathématique, Physique et Informatique, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4253 NetNorth: PHAMGIT@UDEM.BITNET.

Research: I am doing research in Bayesian Methods applied to industry and in general statistical methods to be applied in a work environment (quality control, R & D projects, etc.). Have held the positions of Cost Controller at Pratt & Whitney Canada and Manager, Management Science, Bell Canada. I have produced software on work sampling to be used by industrial engineers. Can do consultation work on various aspects of statistical analysis.

204. **PICOT, JULES J. C.** BE (Nova Scotia Technical College); SM (MIT); PhD (Minnesota). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Transport phenomena; spray technology, including spray atomizer characterization and the dispersion and deposition of aerial spray. Also, the effect of shear on molecular orientation of polymer melts.

205. **POHLE, GERHARD WERNER.** BSc (Toronto, Biology); PhD (Toronto,

Zoology). MARINE ZOOLOGY. Huntsman Marine Science Centre, Brandy Cove, St. Andrews, NB E0G 2X0. Tel: (506) 529-3945 Fax: (506) 529-4337.

Research: I am interested in various aspects of crustacean biology. Current research includes: a) comparative functional morphology, e.g. gill grooming; b) larval and post-larval development; and, c) crustacean setae as a taxonomic and phylogenetic tool. Taxonomic interests extend to all marine invertebrates.

206. **PORTER, JULIE MARGARET.** BSc (Acadia, Biology); MSc (Manitoba, Zoology); PhD (Durham, Zoology). FISH AND WILDLIFE SCIENCES, AVIAN ECOLOGY AND BEHAVIOUR. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274 NetNorth: JPORTER@MUN.

Research: 1. Beginning a research programme on large pelagic fishes (tuna, swordfish and sharks). A long-term programme on ecological and behavioural aspects of large pelagic fish biology is planned. 2. As an adjunct professor at Memorial University of Newfoundland I am continuing projects on recruitment to breeding in seabirds. Genetic and behavioural techniques are being explored.

207. **PREMDAS, FRANCIS H.** BSc (Mt Allison); MSc, BEd (UNB); PhD (Manitoba). PHYSIOLOGY. Dept of Biology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5500 ext 5630.

Research: Investigation of changes in insulin secretion in aging animals and spontaneously diabetic rodents. Conservation of orchids native to Eastern Canada: Propagation by meristem tissue culture.

208. **PRONK, ANTONIUS G. (TOON).** BSc (Free U of Amsterdam, Physical Geography); MSc (Free U of Amsterdam, Quaternary Geology). GEOCHEMISTRY, QUATERNARY GEOLOGY. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2206 Fax: (506) 453-3671.

Research: 1. Quaternary mapping, and till, stream sediment and water geochemistry in relation to: a) mineral exploration; b) forestry management; and, c) the environment. 2. We carry out methodology studies and regional geochemistry studies to attract mineral exploration funds to New Brunswick. That data is also useful in landuse planning. 3. Our Quaternary mapping efforts help to reconstruct the last glacial interval and might help us to predict certain climatological changes for the future (global change is here to stay!), separate man-made changes that are ongoing from 'natural' changes that are inherent to earth's history and will ultimately help mankind to adapt its behaviour and save the planet!

209. **RAWLENCE, DAVID J.** BSc, MSc (Canterbury); PhD (UNB). PALAEOECOLOGY, PALAEOLIMNOLOGY. Dept of Biology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5500 ext 5566.

Research: Palaeolimnology and palaeoecology, with particular emphasis on the use of algal remains. Studies have concerned the younger Dryas climatic cooling in eastern Canada, as well as the impact of acid precipitation on maritime lakes.

210. **REINSBOROUGH, VINCENT CONRAD.** BA, MA (Toronto, Chemistry); PhD (Tasmania, Chemistry). CHEMISTRY. Dept of Chemistry, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2361 Fax: (506) 364-2361.

Research: 1. Physical chemistry of surfactant and micellar chemistry. 2. Kinetics and structure of cyclodextrin inclusion complexes in solution especially involving surfactants as inclusate. 3. Ultrasonic relaxation studies in surfactant and cyclodextrin solutions.

211. **RENAULT, THADDEE R.** BSc, MSc (UNB, Forestry). FOREST BIOLOGY (TREE PEST MANAGEMENT). Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3511.

Research: Under general direction of the Program Director, Technical Services, Forestry Canada - Maritimes Region provide advisory services on tree pest management, which includes: a) provision of requested control advice to all levels of government, private industry, and the general public in the Maritime Provinces; b) preparation of extension control leaflets, reports, and publications on major pests of shade trees, nurseries, Christmas tree plantations, and wood products; c) application of results of chemical control field trials to solve problems involving new and other pests not currently covered by rigidly approved government regulations; d) provision of a broad range of recommendations to municipal and provincial governments and individuals on cultivation and management of trees in urban environments; and, e) lecturing to university and technical school students and associations of woodlot owners and Christmas tree producers on important pests.

212. **RICKARDS, E. JEREMY P. S.** Dip Eng (London); Dip Man (McGill). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Industrial engineering.

213. **RIDING, RICHARD THOMAS.** BS (Maine); MS (Wisconsin); PhD (Davis,

California). PLANT ANATOMY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 4582 Fax: (506) 453-4599.

Research: Developmental plant anatomy. Currently engaged in anatomical and histochemical studies of gymnosperm development including variation of leaf form in Zamia and selected north temperate gymnosperms. Main interest is the functioning of the shoot apical meristem and vascular cambium during seasonal cycles, ageing, and reproductive growth. The laboratory is also equipped to study the disruption of normal development by atmospheric pollutants.

214. **RIOUX, PIERRE.** MSc (Moncton, BIology). AQUACULTURE OF FIN FISH, TOXICOLOGY. Aquarium and Marine Centre, PO Box 1010, Shippagan, NB E0B 2P0. Tel: (506) 336-4771 Fax: (506) 336-9646.

Research: 1. Studies on the growth rate of the Atlantic Salmon raised in tanks, submitted to different water temperature and salinity. 2. The effects of an early chronic exposure to sublethal copper upon the olfactory discrimination of rainbow trout (Oncorhynchus mykiss). 3. Water quality monitoring for commercial fish farms.

215. **RIOUX, ROBERT J.** BSc, MSc (Moncton, Marine Biology). HISTOLOGY. Aquarium and Marine Centre, PO Box 1010, Shippagan, NB E0B 2P0. Tel: (506) 336-4771 Fax: (506) 336-9646.

Research: 1. Winter growth and survival rate of the European Oyster (Ostrea edulis) in the waters of Northeast New Brunswick. 2. Trials in maintaining live fish in aquariums.

216. **ROBAK, EDWARD W.** BScFE (UNB); MBA (Maine). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Forest operations administration, decision support systems.

217. **ROBERTS, MARK RICHARD.** BSc (Montana, Forestry); Msc (Montana, Forest Ecology and Silviculture); PhD (Duke, Forest Ecology). ECOLOGY, FORESTRY. Dept of Forest Resources, University of New Brunswick, Bag Service #44555, Fredericton, NB E3B 6C2. Tel: (506) 453-4501 Fax: (506) 453-4599 NetNorth: ROBERTS@UNBMVS1.

Research: My research interests are related to the response of vegetation to disturbance. In particular, I am involved in the following research projects: 1. Effects of clearcutting and forest floor disturbance on seed banks and establishment of woody species from seed in a northern hardwood forest. 2. Regeneration of woody species following different types of harvesting (full-tree and conventional tree-length) in mixed spruce-fir-hardwoods forests. 3. Reproductive strategies and response of herbaceous vegetation to clearcutting and forest floor disturbance. 4. Regeneration of northern hardwood species following clearcutting, strip-cutting, and shelterwood cutting on Prince Edward Island. The objective of these studies is to identify the mechanisms of vegetation response and patterns of natural vegetation succession after disturbance. This knowledge will be useful in designing interventions in forests to produce the desired vegetation with minimal environmental impact.

218. **ROBINSON, JOHN B. L.** BSc, ME (Carleton); PhD (UNB). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Pavement research: vehicle weights and dimensions.

219. **ROBINSON, PETER H.** PhD (Cornell, Dairy Cattle Nurtition). AGRICULTURE. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (505) 452-3260 Fax: (506) 452-3923.

Research: The regional mandate for the dairy cattle herd at Fredericton is the investigation of the impact of silage quality on dairy cattle performance. Within this mandate the long-term goal of my program is to evaluate factors which impact silage quality and how this impact on silage quality can be predicted. The program also aims to better understand how dairy cattle adapt to silages of various qualities, and how best to supplement silages to attain maximum animal performance.

220. **ROBINSON, SHAWN M. C.** BSc (Acadia, Biology); MSc (Simon Fraser, Biology); PhD (UBC, Zoology). ECOLOGY, FISH & WILDLIFE SCIENCES, ZOOLOGY. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: I have a general interest in the ecological interactions between and within species in the marine, nearshore environment and specifically, on the degree of success an organism experiences over its lifetime. Current research projects include: 1. Population processes in the soft-shell clam (Mya arenaria) and the sea scallop (Placopecten magellanicus) pertaining to growth, mortality, and reproduction. 2. The relationship between the reproductive cycle and the physiological condition in soft-shell clams. 3. Distribution and early life history characteristics of sea scallops in relation to environmental parameters. 4. Effect of fishing gear on exploited invertebrate populations.

221. **ROBSON, ROBERT NEWTON.** BSc (UNB, Chemistry); MSc (UNB, Computer

Science); PhD (McGill, Computer Science). COMPUTER AND INFORMATION SCIENCES. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599.

Research: I am interested in integrated programming environments. We are currently designing and implementing one consisting of a syntax directed editor, data structure editor, integrated library, interpreter and high-level program views. We are also interested in studying how to design a distributed programming environment involving networked workstations.

222. **ROGERS, ROBERT JOHN.** BSc (Calgary, Mechanical Eng); MASc, PhD (Waterloo, Mechanical Eng). MECHANICAL VIBRATION. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513 Fax: (506) 453-5025.

Research: There are several research projects related to the vibration and impact of mechanical equipment. Computer simulation techniques are used to predict the time history response of mechanical systems such as heat exchanger tubes rattling against their support plates and machinery drive trains with gears and shafts vibrating torsionally. Experiments are underway to determine semi-empirical relations between the forces and motions for the squeeze film phenomena occurring in the clearance spaces between heat exchanger tubes and support plates. A rotor apparatus is used to validate the rotor simulation results and explore various rotor dynamics phenomena.

223. **ROSEBRUGH, ROBERT DOUGLAS.** BSc, MSc (McMaster, Math); PhD (Dalhousie, Math). MATHEMATICS. Dept of Mathematics and Computer Science, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2530.

Research: Bicategorical methods applied to topos theory and computer science.

224. **ROSS, WILLIAM ROBERT.** BSc (Mt Allison, Physics & Math); PhD (Colorado, Physics). PHYSICS. Dept of Physics, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4723 Fax: (506) 453-4599 NetNorth: ROSS@UNB.CA.

Research: I am currently doing research in theoretical atomic physics. In particular I am interested in the application of Lie groups and Lie Algebras to problems involving equivalent electrons. The most recent research has involved finding unitary matrix elements associated with the Lie group $U(2l+1) \times SU(2)$.

225. **RUTHVEN, DOUGLAS M.** MA, PhD (Cambridge). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO

Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4520 Fax: (506) 453-5025.

Research: Kinetics and adsorption, including adsorption and diffusion in molecular sieves, development of alumina based adsorbents, and pressure swing adsorption processes.

226. **SALONIUS, PETER O.** BSA (Toronto, Microbiology); MSc (Guelph, Microbiology). FORESTRY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3548 Fax: (506) 452-3525.

Research: Organic matter decomposition, forest fertilization, nursery and greenhouse (Mycorrhizae), site preparation, and herbicide.

227. **SAUCIER, DIANE.** BEd (Laval); BSc (UQUAC, Biologie); DEA (Lyon, Neurophysiologie); Doctorat Université (Lyon, Sciences naturelles). NEUROSCIENCES. Université de Moncton - Centre universitaire de Shippagan, PO Box 2000, Shippagan, NB E0B 2P0. Tel: (506) 336-4761 Fax: (506) 336-9870.

Research: The aim of our research is the anatomical and functional study of the olfactory system. The purpose of the current research is to understand the topographical connections between the periphery and the first level of sensory integration by histological and histochemical studies. The actual understanding of the olfactory system allows us to use this particular sensory system as a reference tool for evaluating the toxic effects of pollutants on fish. This study includes both histological and behavioral approaches.

228. **SAUNDERS, RICHARD L.** BSc (Mass, Zoology); MA, PhD (Toronto, Zoology). FISH AND WILDLIFE SCIENCES. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Research in physiology of growth, smolting and reproduction of salmonids. Emphasis on environmental control of these functions and with application in aquaculture.

229. **SAVIDGE, RODNEY ARTHUR.** BScF, MScF (Toronto, Forestry); PhD (Wales, Plant Physiology). FORESTRY. Dept of Forest Resources, University of New Brunswick, Bag Service #44555, Fredericton, NB E3B 6C2. Tel: (506) 453-4501 Fax: (506) 453-4599.

Research: The long-term aim is to devise molecular-level screening methods for use in tree improvement programs concerned with specific aspects of wood quality/quantity. In recognition of the significant negative economic impact made by the high lignin content of our pulpwood species, the emphasis in the short term is on reducing total lignin content and its distribution in particular cell-wall regions of woody cells. Industry has indicated that achievement of a 10% reduction in the lignin content of conifer woods would be the single most important contribution yet made to the pulp and paper industry. Related activities in the area of biotechnology include clonal micropropagation of trees from identifiably superior genetic sources and the mass production of ultra-pure cellulose by microorganisms.

230. **SCHNEIDER, MARC H.** BSc, MSc (SUNY, Wood Products Eng); PhD (SUNY, Wood Science). FORESTRY. Dept of Forest Resources, University of New Brunswick, Bag Service #44555, Fredericton, NB E3B 6C2. Tel: (506) 453-4501 Fax: (506) 453-4599.

Research: 1. Wood-chemicals Interactions. The properties and size of wood are altered by water. I study moisture movement, dimensional stability, and effects of other chemicals on water sorption and movement in wood. Various chemicals, including coatings, adhesives and impregnants alter the properties of wood. I have recently done extensive work on the physical properties of wood impregnated with high polymers, and am currently doing a state-of-the-art review. 2. Wood as Fuel. I have studied wood particulate fuel harvesting, preparation, drying, handling and combustion in automatic-fuelled appliances. Currently, I am doing a state-of-the-art review.

231. **SCHRIVER, ALLISON B.** BScE (UNB, Civil Eng); MScE (UNB, Structural Eng); PhD (McMaster, Earthquake Eng). CIVIL ENGINEERING - STRUCTURAL ANALYSIS. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521 NetNorth: SCHRIVER@UNB.

Research: I am interested in two main areas of research: the structural behaviour of timber connections and their fasteners and the evaluation of dynamic soil pressures on retaining walls in an "at rest" condition.

232. **SCOTT, ROBERT NELSON.** BSc (UNB, EE). BIOMEDICAL ENGINEERING. Institute of Biomedical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4966 Fax: (506) 452-1040.

Research: My primary research concerns electronic control of artificial limbs and related issues. More broadly, I am concerned with electronic instrumentation in medicine, and with the professional development of the specialties of Rehabilitation Engineering and Clinical Engineering.

233. **SEABROOK, JANET E. A.** BSc (Memorial, Biology); MSc (UNB, Biology); PhD (UNB, Plant Physiology). AGRICULTURE, PLANT PHYSIOLOGY, PLANT TISSUE CULTURE. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506)

452-3260 Fax: (506) 452-3923.

Research: Potato Multiplication and Tissue Culture at the Fredericton Research Station. Most of our work is on the cultivated potato, although occasionally we have projects working with other plants. The potato tissue culture programme has three main goals: a) controlling the variability of potato propagation cultures; b) studying the effect of disease on potato material in culture; and, c) regeneration of tissue cultured potato tissue from various explants. The Fredericton Research Station has the largest concentration of research scientists working on the cultivated potato in North America. The Potato Breeding Programme has a national mandate to provide breeding material for cultivar development across Canada. Currently, we are investigating variability in potato tissue cultures by studying apical dominance of shoots evident in vegetative progeny of Canadian-grown cultivars. In collaboration with pathologists, we are investigating the elimination of certain diseases from potato cultures. Regeneration strategies for potato tissues are studied so that the industry can take advantage of gene transformation technologies as they are developed.

234. **SEABROOK, WILLIAM DAVIDSON.** BSc (Carleton, Biology); MSc (Carleton, Zoology); PhD (London, Entomology); DIC (Imperial, Entomology). BIOLOGY, ENTOMOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-3537 Fax: (506) 453-4599.

Research: My laboratory studies insect chemosensory physiology and behaviour with a concentration on insect pheromones and other insect semiochemicals. We also study the application of those compounds to the management of insect pest populations. The current research includes: a) mating behaviour in the spruce budworm; b) the perception and behavioural responses to those chemicals associated with insect body scales; c) the perception of spruce budworm pheromones; d) the use of sex pheromones for the management of populations of the spruce budworm and the blueberry leaftier moth; and, e) the changes in the chemosensory system associated with gregarization of the desert locust.

235. **SEAMAN, ALLEN ARTHUR.** BSc (Guelph, Earth Science); MSc (Toronto, Physical Geography). QUATERNARY GEOLOGY. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2206 Fax: (506) 453-3671.

Research: Research interest is the Quaternary geology of the Province of New Brunswick, and the use of glacial deposits in mineral exploration (drift prospecting). Current research is concentrated primarily on unravelling the complex Quaternary glacial chronology of southern New Brunswick, and determining the bedrock source areas for the various glacial deposits in the area.

236. **SEBASTIAN, LESLIE P.** Dipl For Eng (Sopron); MS, PhD (SUNY). FOREST ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4666.

Research: Wood science: anatomical, physical and mechanical properties.

237. **SEPHTON, THOMAS WILLIAM.** BSc (Mt Allison, Biology); MSc, PhD (Waterloo, Biology). BIOLOGY, ECOLOGY, AQUACULTURE. Fisheries and Oceans, PO Box 5030, Moncton, NB E1C 9B6. Tel: (506) 858-2053 Fax: (506) 857-7732.

Research: The long term objective is to improve our basic understanding of the limiting environmental factors influencing growth, survival and productivity of shellfish populations (wild and cultured) and to develop models of carrying capacity which delineate the controlling attributes for aquaculture site selection. Target species are: blue mussel (Mytilus edulis) and American oyster (Crassostrea virginica). Specifically, my present research includes: a) study of growth, productivity, feeding and carrying capacity of mussels in the Cardigan River, PEI; b) study of the distribution of oyster larvae and larval retention mechanisms in Caraquet Bay, NB; and, c) study of the effects of algal food quality and quantity on the ecological energetics of mussels and oysters.

238. **SHORT, CHARLES ANTONY.** BSc (UNB, Mechanical Eng); MSc (UNB, Mechanical Eng). ENGINEERING. Dept of Forest Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4506 Fax: (506) 453-4599.

Research: Current research interests include: a) use of wood residues in particulate form (shavings, chips, sawdust) as a fuel in small-scale (residential, small commercial and institutional) direct combustion systems; b) handling systems for delivery, storage, reclamation from storage, and on-site conveying of particulate wood residue fuels; c) design and development of processes and equipment for harvesting and transporting trees under off-road conditions; and, d) design and development of equipment for processing wood for various end purposes.

239. **SICHEL, JOHN M.** BSc (McGill, Chemistry); PhD (McGill, Quantum Chemistry); PDF (Bristol, Theoretical Chemistry). CHEMISTRY. Dépt de Chimie et Biochimie, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4313 NetNorth: SICHELJ@UDEM.

Research: Molecular orbital calculations of electronic structures of atoms, molecules and surfaces, with a view to understanding the molecular and electronic structure of various species and intermediates.

240. **SIVASUBRAMANIAN, PAKKIRISAMY.** BSc (Annamalai); MSc, PhD (Illinois, Physiology). DEVELOPMENTAL NEUROBIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4584 Fax: (506) 453-4599.

Research: Primary research interest is in the area of Developmental Neurobiology. Experiments involve the use of transplantation of organ primorida (eye, leg, etc.) which produce supernumerary organs at ectopic sites thus altering the numerical and spacial relationships between the target tissues and the central nervous system or extirpation of organ primordia, thus depriving of the CNS from its targets during development. Using histological, histochemical, immunochemical, ultrastructural, neurophysiological and behavioral techniques, we are trying to identify the determinants of positional information governing axon growth and specific neuronal connections and the influence of target tissues on the organization of CNS itself during development. Although we use the flesh fly, Sarcophaga bullata for these studies (because they are economical to culture, sturdy to surgical operations, large enough for transplantations and extirpations) the principles derived from our studies would be applicable to developing nervous systems in general.

241. **SMALL, ROBERT DONALD.** BASc (Toronto); MS, PhD (California Institute of Technology). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Research interests are in numerical analysis and in other topics of applied mathematics. Recently he has developed nonlinear methods of approximating real valued functions on continuous one-dimensional domains. These methods happen to contain as examples many of the already known nonlinear approximation methods, including Padé approximants. His present endeavors are concerned with the extension of these nonlinear methods to two dimensions and also the numerical reconstruction of probability distributions based on nonlinear methods that use samples data. Research has also been done in the areas of catastrophe theory, nonlinear wave propagation, number theory and biomathematical models.

242. **SMITH, BRUCE PAUL.** BSc (Toronto); MA (UBC); PhD (Toronto, Zoology). ENTOMOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel:

(506) 453-4666 ext 6213 Fax: (506) 453-4599.

Research: The underlying hypothesis throughout the research program is that parasitic larval water mites (Acari: Hydrachnidia) have a profound influence on populations and communities of host insects. Currently involved in three projects: Project #1 deals with the structure of a community composed of aquatic Diptera and Arrenurus spp mites. I am determining the degree of cross-linking in the web of host utilization, and investigating factors determining host selection. Project #2 concerns the relative success of two species of water strider (Hemiptera: Gerridae), and was initiated to test the hypothesis that selective pressure of mite parasitism can alter relative abundance of two host species, thus reshaping the community. Project #3 is designed to follow parasitized Leucorrhinia frigida (Odonata: Libellulidae) individuals in nature, testing the hypothesis that parasitic mites have deleterious effects on individuals within a natural host population.

243. **SMITH, HARRY JOHN.** BSc (McGill, Agriculture); DVM (OVC); MVSc (Toronto, Veterinary Parasitology). VETERINARY PARASITOLOGY. Health of Animals Laboratory, Agriculture Canada, PO Box 1410, Sackville, NB E0A 3C0. Tel: (506) 536-0135 Fax: (506) 536-1801.

Research: Current research involves epidemiologic and immunodiagnostic studies of urban and sylvatic subspecies of Trichinella spiralis in various species of domestic livestock. Investigations on the immunodiagnosis of the beef tapeworm, Taenia saginata in cattle are also underway. These studies are directed towards improved and antemortem diagnoses of parasites of zoonotic significance and the safety of meat products for human consumption.

244. **SMITH, IAN.** BSc (Sunderland, Civil Eng); MSc (Durham, Structural Mechanics); PhD (South Bank, Wood Engineering). WOOD SCIENCE AND TECHNOLOGY, WOOD ENGINEERING. Wood Science and Technology Centre, University of New Brunswick, RR #10, Fredericton, NB E3B 6H6. Tel: (506) 453-4507 Fax: (506) 453-4599.

Research: UNB-Wood Science and Technology Centre was established to aid New Brunswick and Atlantic Region firms involved in various sectors of the wood industry to upgrade and update their industrial process through appropriate applied research and development. These activities are aimed at developing and transferring technology to solve industrial problems and to promote technological and commercial development. Projects are organised within the following work areas: Wood Engineering, Wood Science, and Research and Development in Wood Processing.

245. **SMOLINSKI, WALTER J.** BASc, MASc (Toronto). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Power systems, including energy efficient motor drives.

246. **SOUSA, ANTONIO C.** ME (ULM); MScE, PhD (Manchester). ENGINEERING - THERMAL SCIENCES. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513 Fax: (506) 453-5025 NetNorth: ASOUSA@UNB.

Research: 1. Pressure Liquefied Fuel Tanks - I am interested in the formulation, analysis, modelling, simulation and verification of the fire induced heat transfer to tanks containing pressure liquefied fuel (LPG, LNG). The work is multidisciplinary involving such areas as pool boiling, heat transfer augmentation, free convective flows, pressure relief valves and two-phase flow. Its long-term objective is to improve the safety level of these tanks and for this purpose advanced numerical tools for design and real time field predictions are being developed. 2. Flow in Heat Exchangers - Shellside flow distribution in shell-and-tube heat exchangers is required for the determination of pressure drop, heat transfer and onset of tube vibration. Also, flow maldistribution causes stagnation regions, which, in turn may lead to "hot spots", and accelerated fouling and corrosion. Early detection of the problem through detailed flow field predictions will indicate the appropriate corrective measures yielding to an equipment with improved lifetime and reliability. The immediate objectives of this research work are to develop and incorporate in the already existing computational predictive tools the following features: a) enhanced turbulence closures for the shellside flow; b) fast computer aided techniques for geometry generation of tube bundles and baffles; and, c) new constitutive relations and innovative algorithms to calculate flows and heat transfers in powerplant condensers.

247. **SOUTH, GRAHAM ROBIN.** BSc, PhD (Liverpool, Botany). MARINE PHYCOLOGY. Huntsman Marine Science Centre, Brandy Cove, St. Andrews, NB E0G 2X0. Tel: (506) 529-8895 Fax: (506) 529-4337.

Research: My principal, long-term project, is to catalogue and undertake biogeographical studies on the benthic marine algae of the North Atlantic Ocean. Secondarily, I am engaged in studies on biofouling of salmonid cage aquaculture systems, focusing on southwestern New Brunswick. Specific projects that are encompassed by the above are: a) checklist of Marine Algae of the North Atlantic Ocean (with I. Tittley, British Museum, Natural History); b) florestics and biogeography of marine algae of eastern Canada, with emphasis on Newfoundland and New Brunswick; c) checklist of marine algae of eastern Canada (third revision); d) quantitative and qualitative investigations of algal and animal biofoulers on salmon cage nets; and, e) evaluation of the effects of antifoulant treatments on the settlement and growth of biofoulers on salmon cage nets.

248. **ST PETER, CLINT JOHN.** BSc (UNB, Geology). GEOLOGY. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-3949 Fax: (506) 453-3671.

Research: The thrust of my research is in determining the hydrocarbon potential of Carboniferous and Triassic sedimentary sequences in southern New Brunswick. In particular, I am involved with sedimentological, stratigraphic, and structural studies on the Albert Formation oil shales and on oil and natural gas-bearing Carboniferous and Triassic strata. In the near future it is anticipated that seismic stratigraphy and seismic facies analysis will be applied to the Albert Formation in an attempt to establish the subsurface distribution of known surface facies.

249. **STARKERMANN, RUDOLF.** DR sc techn (Swiss Fed Inst Techn). MECHANICAL ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Multiple automatic control applied to human social interaction.

250. **STEWARD, FRANK R.** SB, SM, ScD (MIT, Chemical Eng). CHEMICAL ENGINEERING. Dept of Chemical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5138 Fax: (506) 453-5025.

Research: 1. Radiative Heat Transfer in Furnace Chambers. Considerable experimental data on the heat transfer within furnaces chambers have been collected on a laboratory test furnace and several utility boilers. A comprehensive mathematical model has been developed to predict the heat transfer within the combustion chamber. 2. LPG Tank Car Explosions and Fires. The internal and external heat transfer associate with a tank containing liquefied fuel under pressure is being investigated with a physical model in the laboratory and experiments in the field. The fundamental mechanism of a BLEVE is being determined. 3. Heat Transfer Within and Around Pool Fires. Measurements have been made on the heat transfer to large objects within pool fires. A mathematical model is being developed from the fundamental equations to determine the flow pattern and temperature distribution within such a fire.

Radiative heat transfer to the surroundings has been calculated and measured. 4. Sulfur Dioxide Removal by Fluidized Bed Combustion. Various types of basic oxides have been reacted under controlled conditions with $SO_2 + O_2$ mixtures and SO_3. The data have been tested against a number of models for gas solid reactions. Experiments are being conducted in a circulating fluidized bed designed and fabricated in our conducted laboratories.

251. **STEWART, JOHN M.** BSc (Saskatchewan); MSc (Regina). BIOCHEMISTRY, PHYSIOLOGY. Dept of Chemistry, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2364 Fax: (506) 364-2361.

Research: I am interested in the metabolism of fatty acids and the interaction of hydrophobic molecules and non-enzymatic proteins. My interests include: a) fatty acid binding proteins - phylogenetic survey focused on invertebrates; b) interaction of myoglobin and fats; and, c) effect of fatty acids on cellular metabolism.

252. **STIRLING, JOHN ALEXANDER ROBERT.** MSc (UNB, Geology). GEOLOGY, GEOCHEMISTRY, MINERALOGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-1387 Fax: (506) 452-1395.

Research: Research activities include mineralogy and petrology of rocks and ores, microprobe analysis, and automated image analysis. Specialties include: a) salt deposits - mineralogy and geochemistry; b) gold deposits - mineralogy and geochemistry; c) U-R volcanic rocks; and, d) volcanic geochemistry, petrology and stratigraphy.

253. **STOJANAC, NADA.** BSc, Dipl Ing Chem, PhD (Zagreb). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4792.

Research: My research interest has always been in the synthesis of biologically-active organic compounds, useful in clinical research: physiologically active indoles (serotonin), tetracyclines, nitrothiofuramides and porphyrins. For quite some time I have been involved in the total synthesis of quassin, the Bitter principle of quassia amara. A stereospecific approach to the synthesis of quassin led us to develop new synthetic methods and reagents which can be applied and tested on different organic systems.

254. **STREET, MICHAEL D.** Chartered Chemist (UK). CHEMISTRY, METALLURGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-8994 Fax: (506) 452-1395.

Research: Involved with research in the Minerals and Fuel Technology Dept.

255. **STRUNZ, GEORGE MARTIN.** BA (Trinity College, Dublin); PhD (UNB, Chemistry). CHEMISTRY. Forestry Canada - Maritimes Region, PO Box 4000, Fredericton, NB E3B 5P7. Tel: (506) 452-3531 Fax: (506) 452-3525.

Research: My research program involves the chemistry of natural products which have the potential to ameliorate problems in forest management. Recently we have focused on research in the following areas: a) insecticides of natural origin, in particular, insecticidal fungal metabolites; b) antifeedants for the spruce budworm, Choristoneura fumiferana; c) synthesis of analogues of the Dendroctonus bark beetle aggregation pheromone frontalin - for structure-activity studies to probe the pheromone-receptor interaction; and, d) natural resistance mechanisms of trees to fungal pathogens.

256. **TARN, T. RICHARD.** PhD (Birmingham, Plant Biology). PLANT BREEDING. Research Station, Agriculture Canada, PO Box 20280, Fredericton, NB E3B 4Z7. Tel: (506) 452-3260 Fax: (506) 452-3923.

Research: The Agriculture Canada Potato Breeding Program is a multidisciplinary research program with two broad objectives. The national objective is to develop new parental lines using the large potato germ plasm resource, to make available to regional programs early generation material for further selection in each region, and to provide support in breeding and selection methods. The regional objective is to develop new potato varieties adapted to the maritime provinces with characteristics required by the industry in this region. The program emphasizes the development of french fry and chip varieties as well as russet and red skins and yellow flesh, and breeding for resistance to major viral, fungal and bacterial diseases.

257. **TAYLOR, ANDREW RONALD ARGO.** BA, PhD (Toronto, Botany). MARINE BIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6216 Fax: (506) 453-4599.

Research: Studies of developmental morphology and life history of Rhodphyta in culture and in the field. Development and ecology of seagrasses. The marine flora of the North Atlantic. Taxonomy of the red algal genus Polysiphonia.

258. **TERHUNE, JOHN M.** BSc, MSc (Guelph); Lic Scient (Aarhus). MARINE MAMMALOGY. Dept of Biology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5500 ext 5633.

Research: Studies on seals in the Bay of Fundy and elsewhere are primarily involved with acoustical communication, behaviour on haul-out sites and the influences of human disturbance. Research examining in-air and underwater seal hearing abilities is being conducted in an indoor pool.

259. **TERVO, RICHARD E.** BSc, MSc (McMaster). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Signal processing and robotic vision.

260. **THIBAULT, JACQUES J.** BSc (Ottawa, Geology). GEOLOGY. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2206 Fax: (506) 453-3671.

Research: Peatland resources management. Coastal zone monitoring of beach processes - describing and documenting the N.B. coastline.

261. **THOMAS, MARTIN L. H.** BSc (Durham, Marine Biology); MSA (Toronto, Fisheries); PhD (Dalhousie, Oceanography); ODH (Guelph, Horticulture). OCEANOGRAPHY, BIOLOGY. Dept of Biology, University of New Brunswick - Saint John, PO Box 5050, Saint John, NB E2L 4L5. Tel: (506) 648-5568 Fax: (506) 648-5528.

Research: My research area is the ecology of littoral and coastal communities. Current projects are: a) community structure and development in the Bay of Fundy littoral; b) growth, population structure and production in Mytilus edulis; c) the ecology of Littorina littorea in Passamaquoddy Bay; d) marine, littoral and coastal communities on Pendleton Island; e) ecology of subtidal ascidian populations in Fundy; f) anemone ecology in Passamaquoddy Bay; g) structure and growth in algal-vermetid reefs, Bermuda; h) ecology of inland anchialine pools of Bermuda; and, i) mangrove ecology in Bermuda.

262. **THOMPSON, ROBERT G.** BSc (Queen's); MSc, PhD (Simon Fraser, Biology). PLANT PHYSIOLOGY (AGRICULTURE, FORESTRY, BIOCHEMISTRY). Dept of Biology, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2500.

Research: Research activities are based on principles of plant physiology and how they can be applied to meet problems encountered in forestry and agriculture. Three main aspects of my research are as follows: 1. Use of short-lived isotopes ^{11}C and ^{13}N to study carbon and nitrogen transport and utilization in plants. This technique has been used to identify varieties of winter wheat and barley which are frost resistant and can continue to be metabolically active under low temperature and hypoxic conditions. Identification of these kinds of traits can be useful in breeding varieties capable of survival in our harsh Maritime climate. 2. An electrical technique for monitoring tissue capacitance has been developed at Mount Allison. It correlates very well with tree vigor and can be used to assess the effects of insects, drought and other adverse conditions on the growth of trees. 3. Screening of chemical compounds for their effect on growth of plants. Projects have involved understanding the theory behind geotropism in shoot bending and identifying a herbicide which will control weeds in domestic stands of fiddlehead ferns.

263. **THORNLEY, JOHN CLIFFORD.** BSc (London, Metallurgy); PhD (Bradford, Metallurgy). PHYSICAL METALLURGY. Research and Productivity Council, PO Box 20000, 921 College Hill Rd, Fredericton, NB E3B 6C2. Tel: (506) 452-1378 Fax: (506) 452-1395.

Research: Development of procedures to assess the present condition of structures and components in current service. This is principally the development of in-situ metallographic procedures and similar metallurgical techniques for site rather than laboratory implementation. The aim is to provide refinery, pulp mill, ship and utility management personel with clear information about the continued use of major equipment when its structural integrity is in doubt.

264. **TORFASON, LOUIS E.** BE, MSc (Saskatchewan). MECHANICAL ENGINEERING. Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4513.

Research: Analysis and synthesis of planar and spatial mechanisms, including robotics.

265. **TORY, ELMER MELVIN.** BSc (Alberta, Chemistry); PhD (Purdue, Chemical Eng). APPLIED MATHEMATICS, THEORETICAL ENGINEERING. Dept of Mathematics and Computer Science, Mount Allison University, Sackville, NB E0A 3C0. Tel: (506) 364-2541.

Research: Simulation and Modelling of Natural Phenomena. My research has focused on two areas of study: sedimentation and random packing. D.K. Pickard and I formulated and developed a stochastic model for the sedimentation of small (but non-Brownian) particles in a viscous fluid. Our theory explains the many experimental results which are in disagreement with Kynch's theory. My colleagues and I have simulated random packing of spheres, discs, squares, cubes, and other shapes. Our work in this area has been widely cited and our computer programs have been circulated to numerous other researchers.

266. **TRANQUILLA, JAMES M.** BScE, MScE (UNB); PhD (Toronto). ELECTRICAL ENGINEERING. Dept of Electrical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4561.

Research: Antennas and radiating systems, including broadband radiation systems, microwave heating, antenna modelling and design (Radiating Systems Group).

267. **TREMBLAY, ROGER J. A.** BSc (McGill, Horticulture). AGRICULTURE. Dept of Agriculture, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2108 Fax: (506) 453-7978.

Research: Evaluation and development of new crops, varieties, products and technologies in regard to small fruits.

268. **VALENTA, ZDENEK.** Dipl Ing Chem (ETH, Zurich); MSc, PhD (UNB). CHEMISTRY. Dept of Chemistry, University of New Brunswick, Bag Service #45222, Fredericton, NB E3B 6E2. Tel: (506) 453-4792 ext 7253 Fax: (506) 453-4599.

Research: My research group is working primarily in the field of total synthesis of organic compounds of pharmacological and/or biological interest. Included are substances which have shown antineoplastic and antiviral activities, as well as potential antiestrogens of possible use in the treatment of some female breast cancers and compounds showing choline esterase inhibition activity (memory, Alzheimer's disease). Research on synthetic use and mechanism of the Diels-Alder reaction and other synthetic reactions is also in progress.

269. **VALSANGKAR, ARUN J.** BE (Marathawada); ME, PhD (IIS Bangalore). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Geotechnical engineering; soil-structure interaction, raft foundations, pile structures, and superstructure-foundation-soil interaction.

270. **VAN DE POLL, HENK WOUTER.** BSc, MSc (UNB, Geology); PhD (Swansea, Wales, Geology). GEOLOGY - SEDIMENTOLOGY. Dept of Geology, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4803 Fax: (506) 453-5055.

Research: Physical diagenesis of clastic terrestrial sedimentary rocks - and their effects on our ability to accurately interpret sedimentary facies.

271. **VAN GUELPEN, LOUIS COLLIER.** MSc (Memorial, Marine Biology). ICHTHYOLOGY. Huntsman Marine Science Centre, Brandy Cove, St. Andrews, NB E0G 2X0. Tel: (506) 529-3945 Fax: (506) 529-4339.

Research: Ontogeny and taxonomy of marine fishes.

272. **VANICEK, PETR.** Dipl Ing (CVUT, Geodesy); PhD (CSAV, Mathematics & Physics). GEOPHYSICS - GEODESY. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5144 Fax: (506) 453-4943.

Research: My main interest is in theoretical geodesy. Current research topics include: a) geoid computations and applications; b) measuring geometric strength of geodetic networks; c) temporal variations of gravity; d) vertical crustal motions in Canada; e) boundaries at sea; f) sea surface topography; g) global positioning system; h) calibration of water tide gauges; i) mathematical spectral analysis; and, j) unholonomity of hights.

273. **VENART, JAMES E. S.** BSc (Toronto, Mechanical Eng); PhD (Glasgow, Mechanical Eng). MECHANICAL ENGINEERING. Fire Science Centre/Dept of Mechanical Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4509 Fax: (506) 453-5025 NetNorth: JM@UNB.CA.

Research: Experimental and analytical thermodynamics and heat transfer, including bivalent heat pumps, pressure liquefied gas tank thermal response (Fire Science Centre), LDA and full field flow visualization and analysis.

274. **VIOLETTE, DONALD.** BSc (Moncton, Math); MA (Ottawa, Math); PhD (Sherbrooke, Math). MATHEMATICS. Dépt de Mathématique, Physique et Informatique, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4325 Fax: (506) 858-4541.

Research: Mes recherches portent essentiellement sur la théorie de l'indice de point fine pour les fonctions multivoques non compactes. Comme application, il y a la résolution des équations différentielles univoques a discontinuités non-linéaires. Mon intérêt va égolement pour les fonctions multivoques différentiables et continument différentiables. Nous avons donné une nouvelle définition de ces notions et nous avons un théorème de la moyenne et un théorème du reste, qui dans le cadie univoque, sont ceux que nous connaissons tous.

275. **VO-VAN, TRUONG.** BScA (Montreal, Engineering Physics); MSc (Moncton, Physics); PhD (Toronto, Physics). PHYSICS. Dépt de Mathématique, Physique et Informatique, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4337 Fax: (506) 858-4541.

Research: We are mostly interested in optical and electrical properties of materials and their films, both from the point of view of theory as well as experiment. For applications, we aim at producing selective solar surfaces, thin films for detection of gases, electrochromic devices for energy management of buildings and display technology, and anti-reflection coatings. We are also working on optical instrumentation.

276. **VOLPE, YVES.** MSc (Moncton). CHEMISTRY. Université de Moncton - Centre universitaire Saint-Louis-Maillet, 165 Hebert Blvd, Edmundston, NB E3V 2S8. Tel: (506) 735-8804 Fax: (506) 739-5373.

Research: I am working to develop chemistry software programs (educational) on the Macintosh using HyperCard as the engine software. The programs are written in French. We have developed a stack on nomenclature of organics and inorganic compounds, and we have also a stack on stoichiometry.

277. **WAIWOOD, KENNETH GEORGE.** BSc (Biology); MSc (Queen's, Biology); PhD (Guelph, Zoology). AQUACULTURE. Biological Station, Fisheries and Oceans, St. Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: I am conducting research on new species for aquaculture, specifically marine finfish species such as halibut and haddock.

278. **WALKER, DAVID FRANK.** BSc, MSc (Guelph, Agriculture). AGRICULTURE. Dept of Agriculture, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2172 Fax: (506) 453-7978.

Research: My global interest is in grain production, with the specific interest of improving both yield and quality of wheat, oats and barley grown in New Brunswick. Specific research could include evaluating nitrogen source and rate and its effect on yield and quality: a) seeding rate x date studied; b) evaluation of growth regulators and their effect on lodging; c) disease control with the application of fungicide; d) cultivar evaluation; and, e) weekly growth analysis of wheat, barley, and potatoes to determine dry matter accumulation and nutrient uptake. A second area of interest is the production of grain or grain type that have not traditionally been grown in the province. Examples of types of grains that have been evaluated to date include milling wheat (for human consumption), malting barley and durham wheat.

279. **WARD, GERALD B.** BScE (UNB); MSc (Northwestern). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Environmental engineering.

280. **WARE, COLIN.** BSc (Durham); MA (Dalhousie); PhD (Toronto); MMath (Waterloo). COMPUTER SCIENCE. School of Computer Science,

University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Principal research interest is the development of visual user interfaces. Some of his current projects in this applied area are as follows: 1. 3D Spatial Interaction. This study investigates the potential of a 6D "mouse" which encodes both position and orientation for manipulating images of three dimensional scenes. 2. Using Colour in Information Display. Current work includes the design of an interactive colour geometry and the use of colour sequences for univariate maps. 3. Computer Animation. This is a study to develop techniques for Stimulus-Response animation wherein graphic objects are told how to behave and then left to animate themselves. 4. Tools for Visualizing and Manipulating Spatial Data. A collaboration between a group of computer scientists and surveying engineers to study techniques for Ocean Mapping using high performance computer graphics.

281. **WASSON, W. DANA.** BSc (UNB); SM (MIT); PhD (Waterloo). COMPUTER SCIENCE. School of Computer Science, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4566 Fax: (506) 453-4599 Telex: 014-46202.

Research: Research interests are in pattern recognition and computer vision applications. He is currently supervising a PhD student who has developed a method of determining the orientation of flat surfaces in 3-D using a point-light source. The method requires data on reflected light intensity and direction to be recorded or collected in a single 2-D array. Other research interests include computer assisted logic design, and in particular the use of programmable logic devices (PLD's) in logic design.

282. **WAUGH, LLOYD M.** BScE (UNB); MS, Engr (Stanford). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Construction engineering and management, including expert systems.

283. **WEIL, FRANCIS.** BEng (Paris, Telecom); MSc, PhD (Dalhousie, Physics). PHYSICS. Dépt de Mathématique, Physique et Informatique, Université de Moncton, Moncton, NB E1A 3E9. Tel: (506) 858-4301 Fax: (506) 858-4541.

Research: In the past I have done research in high energy physics. I have worked with neutrinos and photons. Lately I have become interested with environment problems: nuclear energy, solar energy, etc.

284. **WELLS, DAVID E.** BSc (Mt Allison); BASc, MASc (UBC); PhD (UNB). SURVEYING ENGINEERING. Dept of Surveying Engineering, University of New Brunswick, Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4698.

Research: Marine geodesy; satellite geodesy, including arctic navigation/satellite positioning, arctic marine navigation aids, GPS hydrographic positioning system, and NAVSTAR positioning.

285. **WHITE, JOSEPH CLANCY.** BSc, PhD (Western Ontario, Geology). GEOLOGY, MATERIALS SCIENCE. Dept of Geology, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4804 Fax: (506) 453-5055.

Research: Research centres on microstructural and microchemical characterization of materials, primarily rocks and minerals, by electron microscopy (SEM & TEM). These techniques are used to extract high resolution process-related information. Current projects include pressure-induced vitrification of silicates, mass transfer in high temperature fluids and ensuing crystal-chemical and microstructural changes in K-feldspar and the structure and chemistry of interfaces and grain boundaries.

286. **WHITNEY, NORMAN J.** BSc (Alberta); MSc (Western Ontario); PhD (Toronto). MYCOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6218 Fax: (506) 453-4599.

Research: Marine Mycology - This entails the identification of fungi in the Bay of Fundy and Northumberland Strait, their physiological activities including interference competition, the isolation and identification of secondary Metabolites with antagonistic properties and the ecological significance of these various aspects. Fungal Diseases of Plants - The main emphases are on resistance in potatoes to verticillium wilt, and hophodermium needle-cast disease on conifers. Bioethics - The research here is on dialogue between scientists and theologians on ethical issues in genetic medicine and science in general.

287. **WIGGS, ALFRED JAMES.** BSc, MSc (UBC); PhD (Alberta). FISH PHYSIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6219 Fax: (506) 453-4599.

Research: Primary interests centre around physiolcgy of fish with special interest in salmonids. Earlier studies centred on protein nutrition, protein metabolism and growth in juvenile salmon. More recently interests have shifted to consider bimodal growth of salmon, parr smolt transformation, and the role of neuro-endocrine system in these processes.

288. **WILLIAMS, PAUL FREDERICK.** BSc (Durham, Geology); MSc (NSW Australia, Structural Geology); PhD (Sydney, Structural Geology). STRUCTURAL GEOLOGY. Dept of Geology, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-5185 Fax: (506) 453-5055.

Research: My primary interest is in deformation mechanisms and the microstructures that they produce in rocks. I am also interested in the development of deformation structures at larger scales and in the application of structural geology to economic problems. My research involves field work and mapping, and I am developing methods of computerised mapping. I am also involved in experimental work both in physical and numerical experiments.

289. **WILSON, FRANK R.** BScE, MScE (UNB); PhD (Birmingham). CIVIL ENGINEERING. Dept of Civil Engineering, University of New Brunswick, PO Box 4400, Fredericton, NB E3B 5A3. Tel: (506) 453-4521.

Research: Transportation and planning. Research interests include: a) accident investigation; b) regional impacts on transportation systems; c) driver perception and reaction; and, d) the transportation implications of free trade.

290. **WILSON, REGINALD ANDREW.** BSc (UNB, Geology). GEOLOGY. New Brunswick Dept of Natural Resources and Energy, PO Box 6000, Fredericton, NB E3B 5H1. Tel: (506) 453-2206 Fax: (506) 453-3671.

Research: Geological mapping at 1/20,000 scale in the Tobique Region of northwestern New Brunswick has been carried out in order to study the physical volcanology, geochemistry, petrography, tectonic setting and mineral potential of Lower Devonian Tobique Group felsic and mafic volcanic rocks. Examination of facies relationships between subaerial and subaqueous felsic lava domes, pyroclastic rocks, and associated volcaniclastic and sedimentary rocks is of particular interest.

291. **YOO, BONG YUL.** BSc (Seoul); MS (Oklahoma); PhD (Berkeley). PHYSIOLOGY. Dept of Biology, University of New Brunswick, Bag Service #45111, Fredericton, NB E3B 6E1. Tel: (506) 453-4666 ext 6220 Fax: (506) 453-4599.

Research: Structure and function of biological membrane, especially the membranes of reproductive cells relating to recognition, interactions and fusion between the egg and spermatozoa: ultrastructure cytochemistry of various biological membranes.

292. **ZITKO, VLADIMIR.** PhD (Slovak Academy of Sciences, Chemistry). CHEMISTRY. Biological Station, Fisheries and Oceans, St.

Andrews, NB E0G 2X0. Tel: (506) 529-8854 Fax: (506) 529-4274.

Research: Detection, identification, and effects of chemicals in the environment; techniques for information extraction and risk assessment, with particular emphasis on the aquatic environment, pesticides and organic chemicals.

293. **ZUNDEL, PIERRE ERNEST.** BScF (Toronto, Forestry); MScF (Toronto, Forest Economics and Harvesting); PhD in progress (Laval, Forest Economics). FORESTRY. Université de Moncton - Centre universitaire Saint-Louis-Maillet, 165 Hebert Blvd, Edmundston, NB E3V 2S8. Tel: (506) 735-8804 Fax: (506) 739-5373.

Research: Research involves two main fields of study: a) impacts of technological change in forestry on economics; and, b) development of computer models of forest harvesting and management activities which aim to help forest managers optimize the use of their resources. Renewable energy research (in biomass production and processing) has also been part of my past research activities.

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21
62
94
108
184

GEOCHEMISTRY

84
186
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252

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186
208
235
248
252

260
270
285
288
290

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8
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123
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65
82
90
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202
207
251
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35
115
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ZOOLOGY

13
14
24
37
102
109
117
174
202
205
220
258

AGRICULTURE CANADA

HEALTH OF ANIMALS LABORATORY
PO BOX 1410
10 SALEM ST
SACKVILLE, NB
E0A 3C0
TELEPHONE: (506) 536-0135

243

RESEARCH STATION
PO BOX 20280
FREDERICTON, NB
E3B 4Z7
TELEPHONE: (506) 452-3260

20
39
51
57
74
86
139
177
199
219
233
256

SENATOR HERVE J MICHAUD
EXPERIMENTAL FARM
PO BOX 667
BOUCTOUCHE, NB
E0A 1G0
TELEPHONE: (506) 743-2464

149
158

AQUARIUM AND MARINE CENTRE

PO BOX 1010
SHIPPAGAN, NB
E0B 2P0
TELEPHONE: (506) 336-4771

61
79
167
214
215

GEORGES L DUMONT HOSPITAL

330 ARCHIBALD ST
MONCTON, NB
E1C 2Z3
TELEPHONE: (506) 858-3232

9

ENVIRONMENT CANADA

CANADIAN WILDLIFE SERVICE
PO BOX 1590
31 WEST MAIN ST
SACKVILLE, NB
E0A 3C0
TELEPHONE: (506) 536-3025

38
117
195

WATER QUALITY BRANCH
PO BOX 861
MONCTON, NB
E1C 8N6
TELEPHONE: (506) 857-6606

11
32
50
193

FISHERIES AND OCEANS

BIOLOGICAL STATION
ST. ANDREWS, NB
E0G 2X0
TELEPHONE: (506) 529-8854

35
58
98
115
148
170
201
202
206
220
228
277
292

SCIENCE BRANCH
PO BOX 5030
MONCTON, NB
E1C 9B6
TELEPHONE: (506) 857-6227

4
7
40
41
47
53
55
66
168
237

FORESTRY CANADA

MARITIMES REGION
PO BOX 4000
FREDERICTON, NB
E3B 5P7
TELEPHONE: (506) 452-3500

21
85
87
94
125
155
164
165
166
192
200
211
226
255

HUNTSMAN MARINE SCIENCE CENTRE

BRANDY COVE
ST. ANDREWS, NB
E0G 2X0
TELEPHONE: (506) 529-8895

205
247
271

MONCTON HOSPITAL

135 MACBEATH AVE
MONCTON, NB
E1C 6Z8
TELEPHONE: (506) 857-5111

12

MOUNT ALLISON UNIVERSITY

SACKVILLE, NB
E0A 3C0
TELEPHONE: (506) 364-2200

DEPT OF BIOLOGY
TELEPHONE: (506) 364-2500

3
5
82
90
102
113
129
135
197
262

DEPT OF CHEMISTRY
TELEPHONE: (506) 364-2361

6
210
251

DEPT OF ENGINEERING
TELEPHONE: (506) 364-2580

111

DEPT OF GEOLOGY
TELEPHONE: (506) 364-2311

91
186

DEPT OF MATHEMATICS AND COMPUTER SCIENCE
TELEPHONE: (506) 364-2530

8
67
75
223
265

DEPT OF PHYSICS
TELEPHONE: (506) 364-2580

42
114
162
172

DEPT OF PSYCHOLOGY
TELEPHONE: (506) 364-2455

31
141

NEW BRUNSWICK DEPT OF AGRICULTURE

PO BOX 5001
GRAND FALLS, NB
E0J 1M0
TELEPHONE: (506) 473-5515

198

PO BOX 6000
FREDERICTON, NB
E3B 5H1
TELEPHONE: (506) 453-2272

45
56
121
267
278

RR #2
FLORENCEVILLE, NB
E0J 1K0
TELEPHONE: (506) 392-6007

147

NEW BRUNSWICK DEPT OF NATURAL RESOURCES AND ENERGY

PO BOX 6000
FREDERICTON, NB
E3B 5H1
TELEPHONE: (506) 453-1802

112
208
235
248
260
290

NEW BRUNSWICK MUSEUM

NATURAL SCIENCES DIVISION
277 DOUGLAS AVE
SAINT JOHN, NB
E2K 1E5
TELEPHONE: (506) 658-1842

54
174
181

RESEARCH AND PRODUCTIVITY COUNCIL

PO BOX 20000
921 COLLEGE HILL RD
FREDERICTON, NB
E3B 6C2
TELEPHONE: (506) 452-8994

30
52
70
83
104
110
133
161
182
252
254
263

SUSSEX TREE NURSERY

RR #4
SUSSEX, NB
E0E 1P0
TELEPHONE: (506) 433-4523

2

UNIVERSITE DE MONCTON

ARCHIBALD ST
MONCTON, NB
E1A 3E9
TELEPHONE: (506) 858-4000

DEPT DE BIOLOGIE
TELEPHONE: (506) 858-4334

14
19
46

DEPT DE CHIMIE ET BIOCHIMIE
TELEPHONE: (506) 858-4331

25
97
132
169
178
190
239

DEPT DE MATHEMATIQUE, PHYSIQUE ET INFORMATIQUE
TELEPHONE: (506) 858-4339

99
203
274
275
283

CENTRE UNIVERSITAIRE DE SHIPPAGAN
PO BOX 2000
SHIPPAGAN, NB
E0B 2P0
TELEPHONE: (506) 336-4761

24
69
116
227

CENTRE UNIVERSITAIRE SAINT-LOUIS-MAILLET
165 HEBERT BLVD
EDMUNDSTON, NB
E3V 2S8
TELEPHONE: (506) 735-8804

10
276
293

UNIVERSITY OF NEW BRUNSWICK

FREDERICTON CAMPUS
COLLEGE HILL
PO BOX 4400
FREDERICTON, NB
E3B 5A3
TELEPHONE: (506) 453-4666

DEPT OF BIOLOGY
TELEPHONE: (506) 453-4584

13
37
43
59
62
64
65
68
78
93
108
120
138
142
160
175
194
213
234
240
242
257
286
287
291

DEPT OF CHEMICAL ENGINEERING
TELEPHONE: (506) 453-4520

44
63
101
136
143
179
183
185
204
225
250

DEPT OF CHEMISTRY
TELEPHONE: (506) 453-4781

23
28
29
92
105
253
268

DEPT OF CIVIL ENGINEERING
TELEPHONE: (506) 453-4521

17
26
27
48
71
73
95
118
127
128
145
154
218
231
269
279
282
289

DEPT OF ELECTRICAL ENGINEERING
TELEPHONE: (506) 453-4561

33
36
77
80
119
137
153
159
187
196
245
259
266

DEPT OF FOREST ENGINEERING
TELEPHONE: (506) 453-4501

18
81
180
188
212
216
236
238

DEPT OF FOREST RESOURCES
TELEPHONE: (506) 453-4501
184
217
229
230

DEPT OF GEOLOGY
TELEPHONE: (506) 453-4804

34
84
270
285
288

DEPT OF MECHANICAL ENGINEERING
TELEPHONE: (506) 453-4513

16
22
72
126
130
151
222
246
249
264

DEPT OF PHYSICS
TELEPHONE: (506) 453-4723

224

DEPT OF SURVEYING ENGINEERING
TELEPHONE: (506) 453-4698

49
76
88
100
140
146
150
171
176
272
284

FIRE SCIENCE CENTRE
TELEPHONE: (506) 453-4509

273

INSTITUTE OF BIOMEDICAL
ENGINEERING
TELEPHONE: (506) 453-4966

157
232

SCHOOL OF COMPUTER SCIENCE
TELEPHONE: (506) 453-4566

15
60
89
96
103
106
122
131
134
144
173
189
191
221
241
280
281

WOOD SCIENCE AND TECHNOLOGY CENTRE
TELEPHONE: (506) 453-4507

244

SAINT JOHN CAMPUS
TUCKER PARK
PO BOX 5050
SAINT JOHN, NB
E2L 4L5
TELEPHONE: (506) 648-5500

DIVISION OF MATHEMATICS, ENGINEERING AND COMPUTER SCIENCE
TELEPHONE: (506) 648-5585

107
124

DIVISION OF SCIENCES
TELEPHONE: (506) 648-5565

109
123
152
156
207
209
258
261